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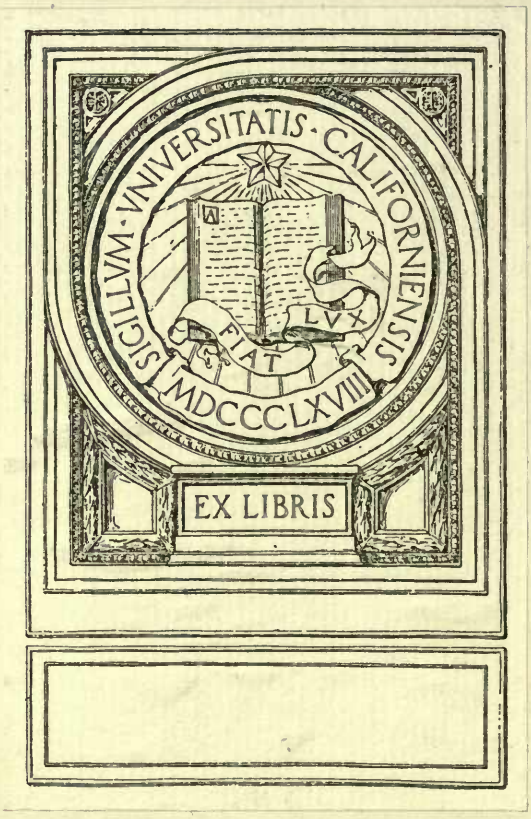
The California Walnut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The Story of the
Introduction and Development of the Walnut
in California

"CLOSE-UP" OF A WELL-LOADED WALNUT TREE

THE CALIFORNIA WALNUT

CALIFORNIA WALNUT GROWERS ASSOCIATION
LOS ANGELES, CALIFORNIA

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PREFACE

The realization of the quality ideals held by the California Walnut Growers Association, through its many years of incessant effort, carries with it a reward that can be appreciated only by those who have striven mightily and succeeded beyond expectation. This ideal has been attained by careful supervision of the industry from the time the tree is planted in the orchard to the moment the nut is ready for shipment. The result is the "California Walnut." To increase the production of so wonderful a food product as the "California Walnut" is a worthy ambition and its accomplishment is proving extremely gratifying to thousands of growers.

In an endeavor to show how these attainments have been brought about and are being perpetuated, this publication is offered.

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ACKNOWLEDGMENTS

Our appreciation is extended to Mr. Carlyle Thorpe and Dr. Leon D. Batchelor for their careful criticism of the manuscript and to the University of California for the use of illustrative material. Recourse has been made to the University of California Bulletin 231, by Professor Ralph Smith, and the Standard Encyclopedia of Horticulture. Direct assistance has been received from a popular treatise on walnuts written by The H. K. McCann Company.

W. T. WEBBER
W. E. GOODSPEED

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A MONARCH OF THE GROVE

THE CALIFORNIA WALNUT

By W. E. Goodspeed

Manager

Field Department

California Walnut Growers Association

CHAPTER ONE

INTRODUCTION

THE record of the Persian walnut as a food of excellence goes back into history for many centuries. The Persians utilized its attractive qualities in their early commerce with the Europeans; the Greeks immortalized its delicate flavor in song and story; the Romans deified it, calling it "The Nut of the Gods," "Jupiter's Acorn." More modern man has long valued it as one of Nature's most gratifying foods, and today the walnut takes its place among the leading articles of daily consumption—a food product rich in nutriment and delicious of flavor, the acme of wholesome diet.

The Persian walnut is a handsome tree of noble proportions. It is thrifty, healthy, and rapid-growing, with a tall, clean trunk of light color. Its wide-spreading top and dense foliage have made it popular as a shade and street tree; its wonderful productivity and extreme longevity have made it the basis of a thriving industry.

The nuts are borne in clusters of two or three; often in greater number. They are enveloped in fleshy green husks which open up and allow the nuts to drop out when mature.

With its probable origin in Persia and contemporary cultivation in China and India, the production of the walnut has spread throughout all the western and southern countries of Europe, the United States, Chile, and other temperate regions. In the United States the cultivation of the Persian walnut is chiefly confined to California. It is commonly misnamed the English walnut, probably because in the early history of commerce the Asiatics used the nut as an article of trade with the Britons. The walnut has never been grown on a commercial scale in England; consequently, the term "English Walnut" is a misnomer. If commerce demands a popular name, it is fitting that this nut be known as the "California Walnut"; thus giving it the name of the region which is foremost in its production and which furnishes commerce a nut of the highest quality.

THE WALNUT IN CALIFORNIA

THIS marketable species of walnut may have been first planted in California by the Mission Fathers; but it was not until the "gold rush" and the influx of Americans in 1849 that the walnut was planted at all extensively. The present wal-

(ABOVE) ITS BEAUTY OF LINE AND SPREAD MAKE THE WALNUT A FAVORITE SHADE TREE
(BELOW) AS A BORDER FOR STREETS AND DRIVEWAYS IT IS UNSURPASSED

THE NUTS ARE BORNE IN CLUSTERS OF TWO TO THREE AND OFTEN MORE

nut industry is of comparatively recent origin, dating back to the introduction of the Santa Barbara soft-shell in 1867 and the French varieties in 1871. From these beginnings the industry has gradually grown until today California produces 97 per cent of the nation's walnut crop.

EXTENT OF THE CALIFORNIA WALNUT INDUSTRY

WALNUTS are now grown on the commercial scale in the Pacific Northwest, and there are a number of notable instances of walnut culture in the Eastern states as well. However, the fact that the walnut tree shows its preference for the soil and climatic conditions of California is borne out by the following facts:

Over 65,000 acres are planted to walnuts in the state of California, giving nearly one and one-half million walnut trees. These 65,000 acres represent an investment of more than $60,000,000.00. The annual crop for the past few years has ranged from 32,000,000 to 40,000,000 pounds of marketable nuts. The production for 1918 was approximately 40,230,680 pounds. The output for 1919 is expected to surpass the 40,000,000-pound mark and may reach 50,000,000 pounds. These figures are a tribute to the rich soil and abundant sunshine of California, and should prove highly gratifying to those whose progressive cultural methods and wholehearted co-operation have made this development possible. They are indeed gratifying when considered from the standpoint of income. The 1918 walnut crop paid the California growers approximately $11,000,000.

The walnut is produced over almost the entire state, but the commercial industry is centered in the south. Orange, Los Angeles, Ventura, and Santa Barbara counties produce by far the bulk of the California walnut crop. Riverside, San Joaquin, and Contra

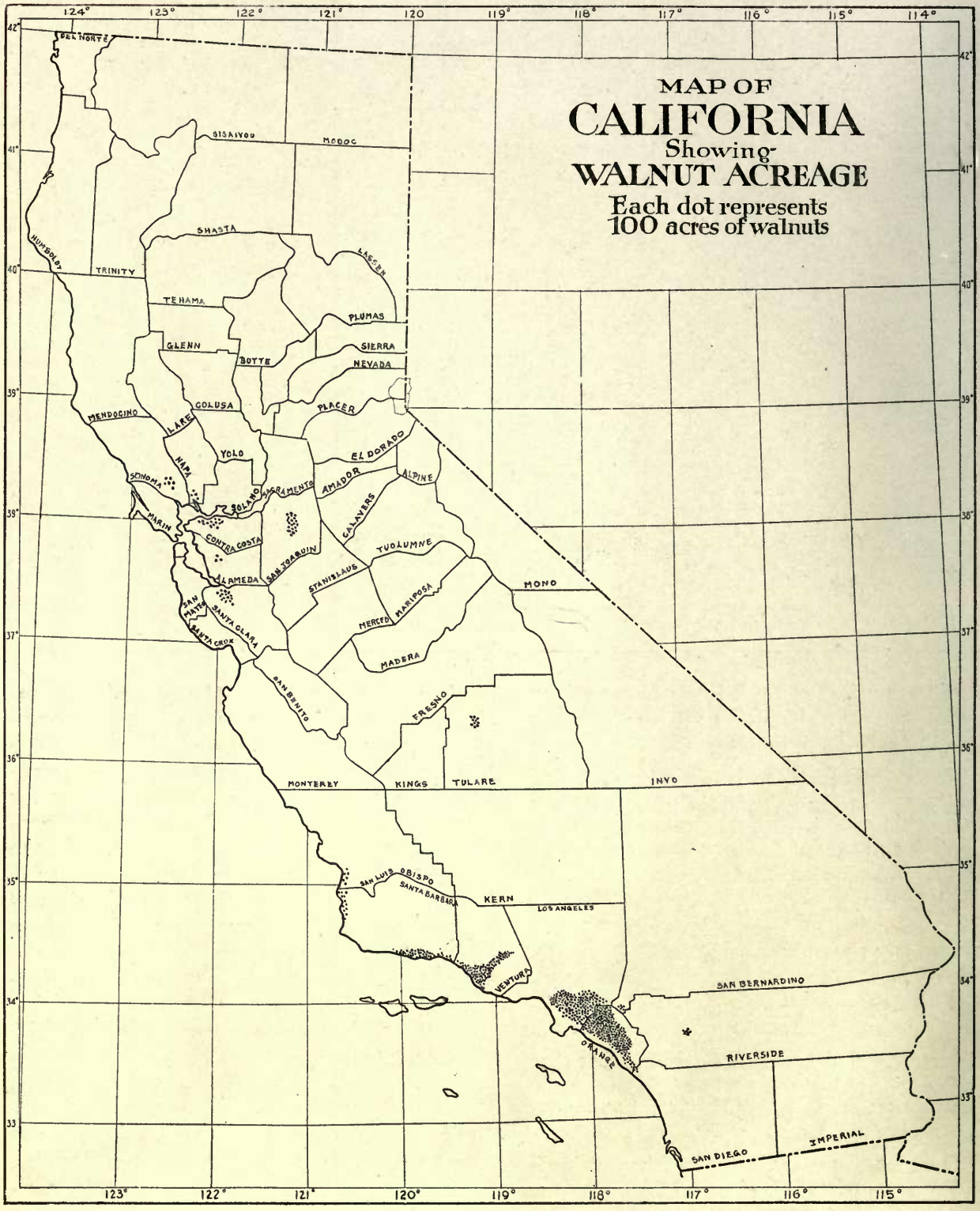
MAP OF
CALIFORNIA
Showing
WALNUT ACREAGE
Each dot represents
100 acres of walnuts
DEL NORTE
SISKIYOU
MODOC
HUMBOLDT
TRINITY
SHASTA
LASSEN
TEHAMA
PLUMAS
GLENN
BUTTE
SIERRA
NEVADA
COLUSA
PLACER
MENDOCINO
LAKE
YOLO
EL DORADO
NAPA
SONOMA
SOLANO
SACRAMENTO
AMADOR
ALPINE
MARIN
CONTRA COSTA
CALAVERS
TUOLUMNE
ALAMEDA
SAN JOAQUIN
STANISLAUS
MONO
SAN MATEO
SANTA CLARA
SANTA CRUZ
MERCED
MARIPOSA
MADERA
SAN BENITO
FRESNO
MONTEREY
KINGS
TULARE
INYO
SAN LUIS OBISPO
SANTA BARBARA
KERN
LOS ANGELES
VENTURA
SAN BERNARDINO
ORANGE
RIVERSIDE
SAN DIEGO
IMPERIAL
124°
123°
122°
121°
120
119°
118°
117°
116°
115°
114°
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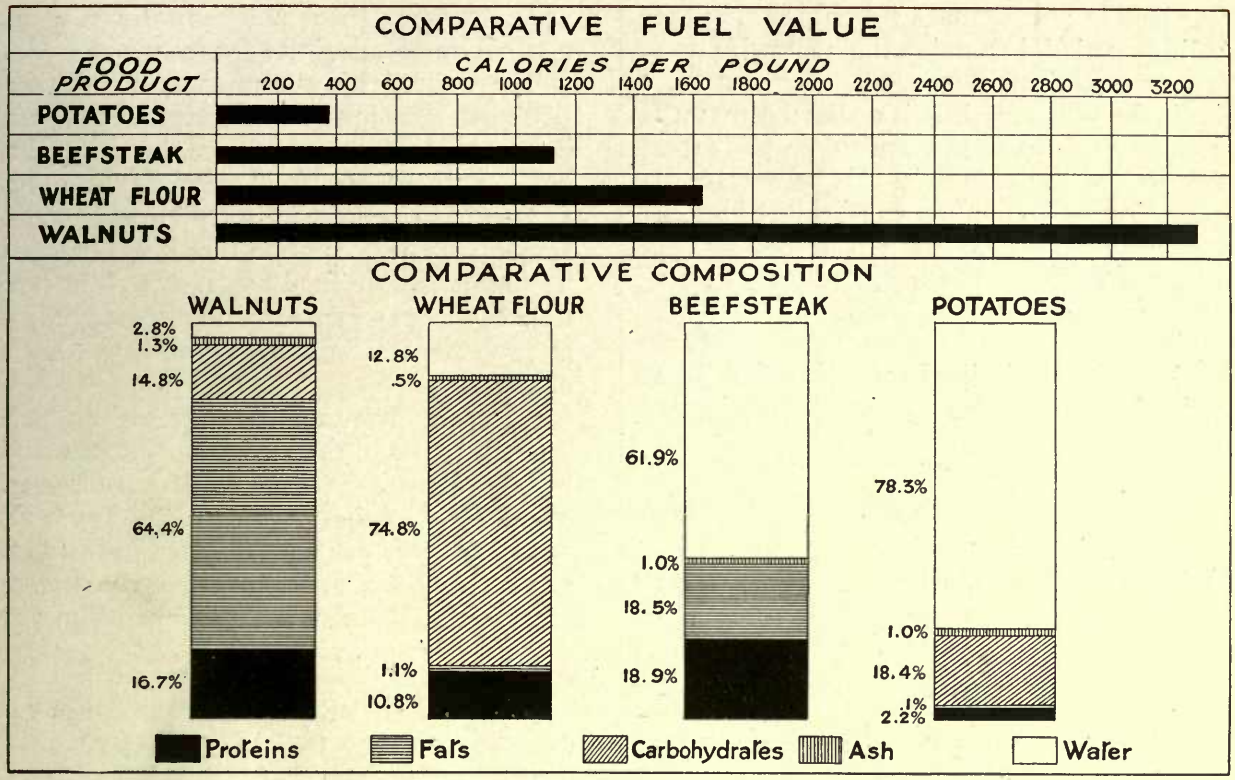
FIGURE I



Costa counties produce a considerable tonnage. (For definite information on distribution of plantings see Figure 1.)

WONDERFUL NUTRITIVE QUALITIES

THE fundamental reasons for this marvelous development, from such humble and recent beginnings, are many. Chief among them, however, are the wonderful nutritive qualities and the stability of the nut itself.

To secure a high place for the walnut in the realm of nutrient foods, it was but necessary to demonstrate, by analysis, that the walnut contains the essential elements for human nutrition in much more abundant quantities than any other article of daily diet. The analysis has long since been made, and it is a proven fact that a pound of walnuts contains more proteins than a pound of wheat flour or potatoes, more fats and carbohydrates than a pound of beefsteak, and has more fuel value than a like amount of either. The above mentioned foods contain 12.8 per cent, 61.9 per cent and 78.3 per cent of water respectively, whereas the walnut contains but 2.8 per cent, which means that the purchaser of walnuts receives more real food to the pound. These figures can be readily verified by referring to United States Department of Agriculture, Farmers Bulletin 122.

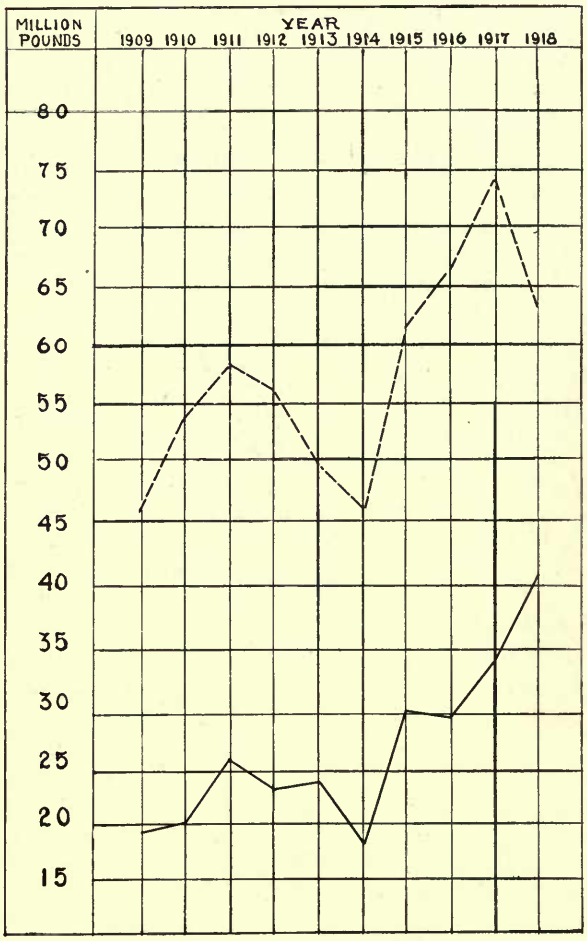
Many like comparisons could be made, all pointing to the fact that the walnut is a much more nutritious and economical article of diet than any of the other daily consumed products.

A STAPLE EVERY-DAY FOOD

WITH these facts in view, it is not difficult to understand why the walnut, formerly a dessert or salad delicacy, has now taken its place with the staple every-day foods. Formerly the walnut

was held in reserve and used only during the holiday period, but today the housewife uses it as a substitute for many other nutrient foods the year round. It is estimated that 40 per cent of the walnut crop is now sold after the turn of the year, and this percentage is increasing as housewives are being educated to the almost unlimited possibilities of the walnut for adding wholesome variety to the every-day menu.

California walnuts are generally used now in place of meat during Lent and on fast days and are recommended by many of the most prominent physicians and sanitariums as an alternative or substitute for meat.



DURING THE LAST TEN YEARS THE INCREASE IN CONSUMPTION HAS EXCEEDED THE INCREASE IN PRODUCTION

NOTE—The decreased consumption for 1918 is due to decrease in importations, on account of war conditions

The walnut enjoys a most unique distinction among tree products, inasmuch as it can be stored for a year or more, awaiting disposal, without loss from depreciation. This feature has given the industry a stability and freedom from speculation that is not enjoyed by the perishable food crops. A walnut produced is money earned, without the anxiety of probable loss in storage while awaiting a market.

Another advantage that the walnut possesses is found in the fact that it blooms and bears fruit after the danger from frost is over. The absence of the "smudge pot" in the walnut industry is one of its attractive features. Even in California, where climatic extremes are practically unknown, this quality of the tree is not unappreciated.

WALNUT PRODUCTION AS A BUSINESS IN CALIFORNIA

ACCORDING to a published statement of C. Thorpe, general manager of the California Walnut Growers Association, the normal consumption of walnuts in the United States is now around 70,000,000 pounds annually and is increasing rapidly.

The consumption for the period October, 1917, to October, 1918, amounted to about 74,000,000 pounds. From Government statistics, the average annual import of walnuts (unshelled and shelled) for the last ten years is 30,924,712 pounds. The average annual California crop for the same period is 25,375,000 pounds.

Since California produces 97 per cent of the domestic walnut crop, it is evident that during the past ten years our imports have exceeded our domestic production. This fact forcibly suggests that there is a profitable opportunity for increased walnut planting in California with no danger of over-production. This fact is further borne out by the steady increase in prices during the last fifteen years.

TEN YEARS' PRODUCTION, IMPORTATION, AND CONSUMPTION

(EXPRESSED IN POUNDS)

Year	California Production	Computed U. S. Production	U. S. Importations	Consumption in U. S.
1909	18,700,000	19,278,000	26,214,000	45,492,000
1910	19,200,000	19,794,000	34,230,000	54,024,000
1911	25,000,000	25,774,000	32,390,000	58,164,000
1912	22,500,000	23,196,000	32,922,000	56,118,000
1913	22,700,000	23,402,000	26,456,000	49,858,000
1914	17,800,000	18,350,000	27,770,000	46,120,000
1915	29,650,000	30,570,000	31,540,000	62,110,000
1916	29,200,000	30,104,000	36,056,000	66,160,000
1917	33,000,000	34,020,000	40,416,000	74,436,000
1918	40,230,680	41,474,928	*21,248,000	*62,722,928

*Reduction due to restricted importations through lack of transportation from Europe.

LAND VALUES

THE valuation of walnut land and land planted to walnuts varies widely in different localities and is dependent largely upon soil and climatic conditions, which either increase or decrease profitableness. With land already planted to walnuts, there is the added factor of type and condition of trees. Geographic location, of course, has an economic bearing.

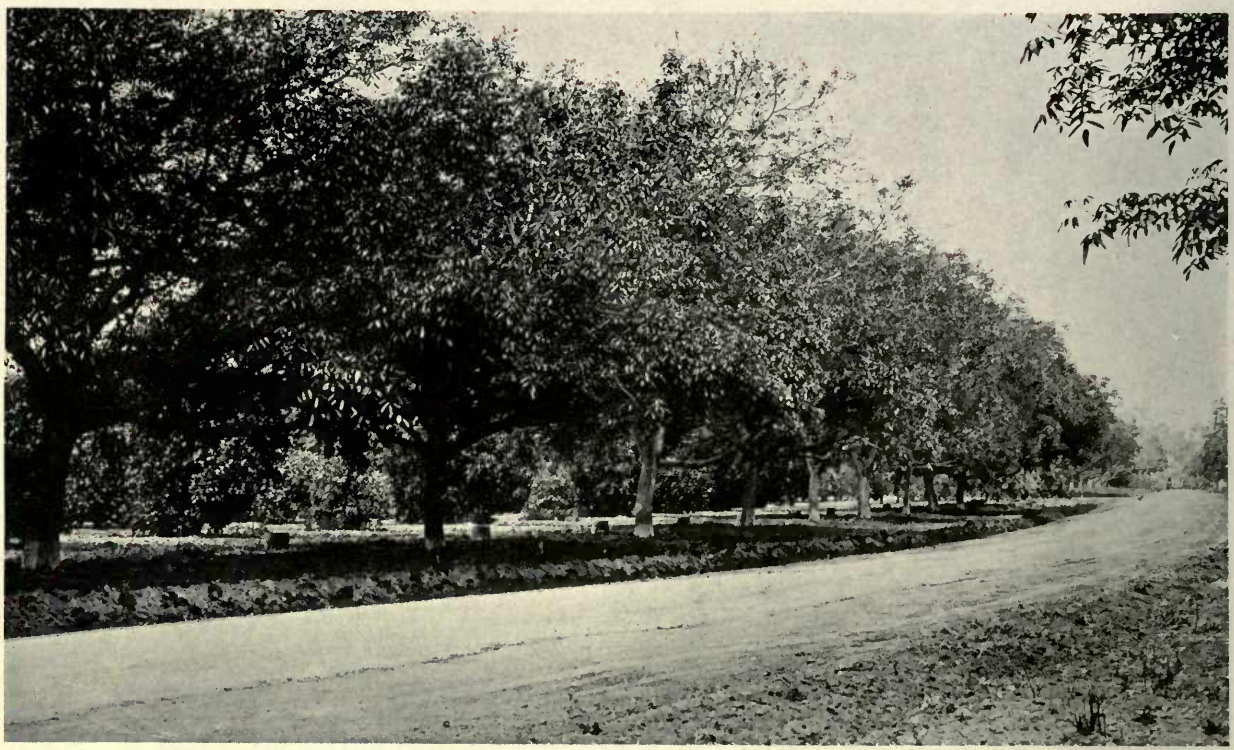
Bare land under irrigation in the walnut sections of California, suitable for planting, is held at from $600.00 to $1000.00 an acre (average from the replies of 922 growers, $733.41). Land planted to walnuts, not yet in bearing, is valued at from $800.00 to $1200.00 an acre. Bearing walnut properties can be purchased from $900.00 to $2000.00 per acre. Several mature walnut groves have recently changed hands for $1500.00 an acre. Nine hundred twenty-two growers, in various localities, recently placed an average valuation of $995.00 on their non-bearing walnut plantings and an average of $1299.02 per acre on their bearing groves.

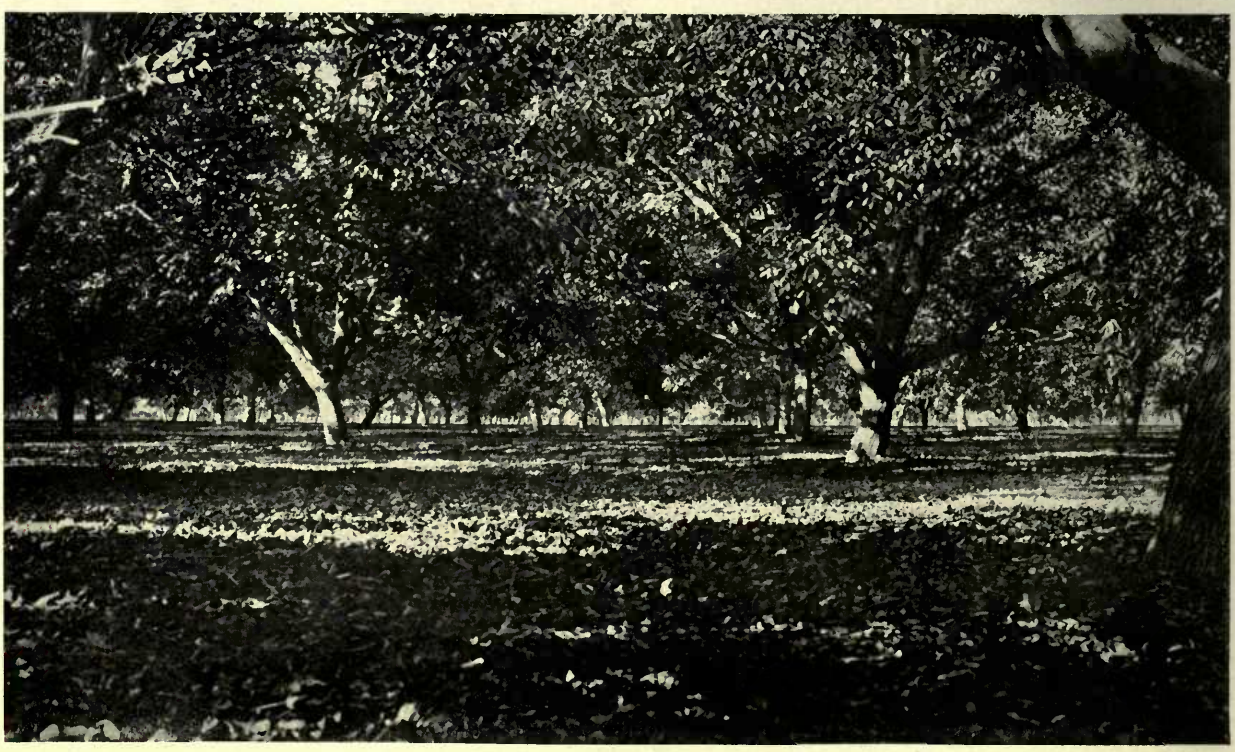
PERIOD OF BEARING

THE walnut usually comes into bearing at from five to nine years from time of planting. A recent survey of some 12,000 acres of walnuts, producing under varying conditions, gives eight years as the average time to arrive at profitable bearing. With good treatment a walnut tree will bear indefinitely. There are trees in France and other parts of the Old World which are known to have been producing for hundreds of years. Many trees in California are producing bounteous crops at fifty years of age and over. With good cultural care, the older the walnut tree becomes, the greater is its productivity. Of the California groves old enough to base judgment on, the oldest trees in the grove are producing the heaviest.

YIELD

THERE are commercial walnut groves in the state of California which produce over a ton of marketable walnuts to the acre annually. There



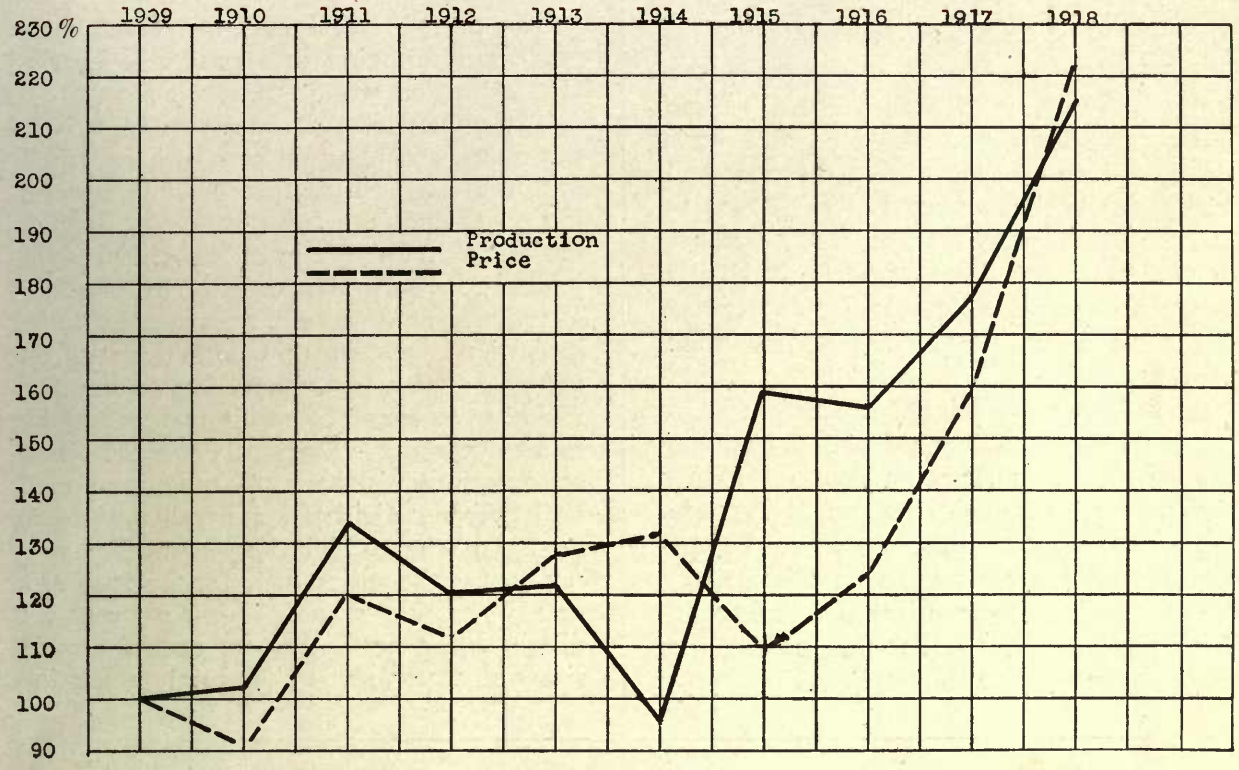


(ABOVE) THE WALNUT A "TAX-PAYER" FOR AN ORANGE GROVE
(BELOW) THERE IS NO PICTURE MORE RESTFUL THAN THAT PRESENTED BY THE CALM, SHADOWY DEPTHS OF A WALNUT GROVE

CLOSE VIEW OF A WELL-LOADED CALIFORNIA WALNUT TREE FOUR MONTHS BEFORE THE NUTS HAVE MATURED

THE NUTS ARE ENVELOPED IN HULLS WHICH OPEN AND ALLOW THE NUTS TO DROP WHEN MATURE

(ABOVE) A SIXTEEN-YEAR-OLD WALNUT TREE NEAR WHITTIER, CALIFORNIA
(BELOW) MANY MILES OF CALIFORNIA'S FINE ROADS ARE BORDERED WITH STATELY WALNUT GROVES



THE INCREASE IN WALNUT PRICES HAS KEPT PACE WITH THE INCREASE IN WALNUT PRODUCTION

are many that produce over 1000 pounds. The actual 1918 yield of the 922 growers referred to above gave 949 pounds per acre for trees over twelve years of age, and an average of 500 pounds per acre for trees from seven to twelve years old. A safe estimate for business purposes is 900 to 1200 pounds per year, per acre, for mature trees.

PRICES RECEIVED FOR WALNUTS

THE prices here quoted are f.o.b. at point of shipment, and represent approximately 1½ cents a pound more than actually received by the grower; this difference being the net cost of grading, packing and marketing the product for those growers who are members of the California Walnut Growers Association.

The opening f.o.b. prices of the California Walnut Growers Association for 1918, were:

No. 1 Soft Shell	28c per pound
No. 2 Soft Shell	25c per pound
Fancy Budded	31½c per pound
Standard Budded	29c per pound
Jumbos	31c per pound

These prices were maintained throughout the selling season.

PRODUCTION AND PRICES FOR PERIOD OF TEN YEARS

Year	Production (Pounds)	Price Per Pound No. 1 Soft Shell (Cents)	Price Per Pound Fancy Budded (Cents)
1909	18,700,000	11.5	15.0
1910	19,200,000	15.0	17.5
1911	25,000,000	14.0	16.5
1912	22,500,000	14.0	16.5
1913	22,700,000	16.0	19.0
1914	17,800,000	16.5	20.0
1915	29,650,000	13.6	17.0
1916	29,200,000	15.5	19.0
1917	33,000,000	20.1	24.1
1918	40,230,000	28.0	31.5

Prices f. o. b. California

EXPENSE OF OPERATION

THE above-mentioned survey of 922 growers, representing about 12,000 acres of walnuts, is used as a basis for the following figures: Cost of trees and setting out per acre ranged from $20.00 to $50.00; average of plantings, $28.40. Budded trees cost from $1.00 to $1.50 per tree, so the expense of starting an acre at this time would be nearer $50.00 than $20.00.

Annual cost of maintenance before bearing, including taxes, ranged between $20.00 and $70.00 per acre, average $42.00 on plantings of 20 acres and larger; and between $25.00 and $75.00 with an average of $47.00 on plantings of from 1 to 20 acres. The average of all plantings considered was $45.00. With the use of intercrops this is often reduced to a negligible amount.

The average total cost of planting the grove and bringing into profitable bearing of 922 growers was $257.65 per acre.

The annual cost of operation of a bearing grove, including all cost such as irrigating, fertilizing, cultivation, pruning, harvesting, taxes, etc., ran from $32.00 to $100.00 per acre with an average of $61.00 for plantings of 20 acres and over. This cost increased as the acreage decreased. A safe estimate for business purposes puts the normal cost of operation between $40.00 and $60.00 per acre.

The average cost of packing and marketing to members of the California Walnut Growers Association is about 1½ cents per pound, or, based on a yield of 1000 pounds per acre, $15.50 per acre. This item amounted to 5 per cent of the selling price for the 1918 crop or 1½ cents per pound. This 5 per cent was distributed, 3 per cent to the central association and 2 per cent to the local association.

INCOME TO BE DERIVED FROM CALIFORNIA WALNUTS

	Safe Estimate for Business Purposes	Income Which Competent Men May Hope to Obtain	Income Not Infrequently Obtained Under Favorable Conditions
Yield per acre	1,000 lbs.	1,500 lbs.	2,000 lbs.
Valuation per acre	$1,100.00	$1,500.00	$1,800.00
Gross income (1)	$163.70	$245.55	$327.40
Annual cost of operation per acre (2)	$60.00	$50.00	$55.00
Cost of packing and marketing	15.50	22.50	30.00
Total expenses	75.50	72.50	85.00
Net income	$88.20	$173.05	$242.40
Interest on valuation	8.02%	11.54%	13.47%

(1) Based on average selling price of No. 1 Soft Shell for last ten years—16.37 cents per pound. The average selling price for the next ten years will probably be higher.

(2) *All costs,* including irrigating, fertilizing, cultivation, pruning, harvesting, taxes, etc.

CHAPTER TWO

Culture of the California Walnut

THE creation of a superior food product from the elements of soil and atmosphere affords an interesting occupation and should make a narrative well worth the reading. Modern walnut production is not a monotonous succession of soil-tilling, seed-sowing, and bounteous harvest-gathering. The production of the California walnut takes as much time, thought, and intelligence as any other business concerned with the production of quality goods.

As a matter of interest to those who are unfamiliar with the California walnut industry and as a possible source of information to those directly interested, the following notes on culture are given.

PROPAGATION

THERE are various possible methods of starting a walnut orchard, each of which has had its era of popularity and still retains supporters. Within the last ten or fifteen years the demand has increased for nursery-grafted trees of given variety on known rootstock. At present this is the only method of propagation to be recommended.

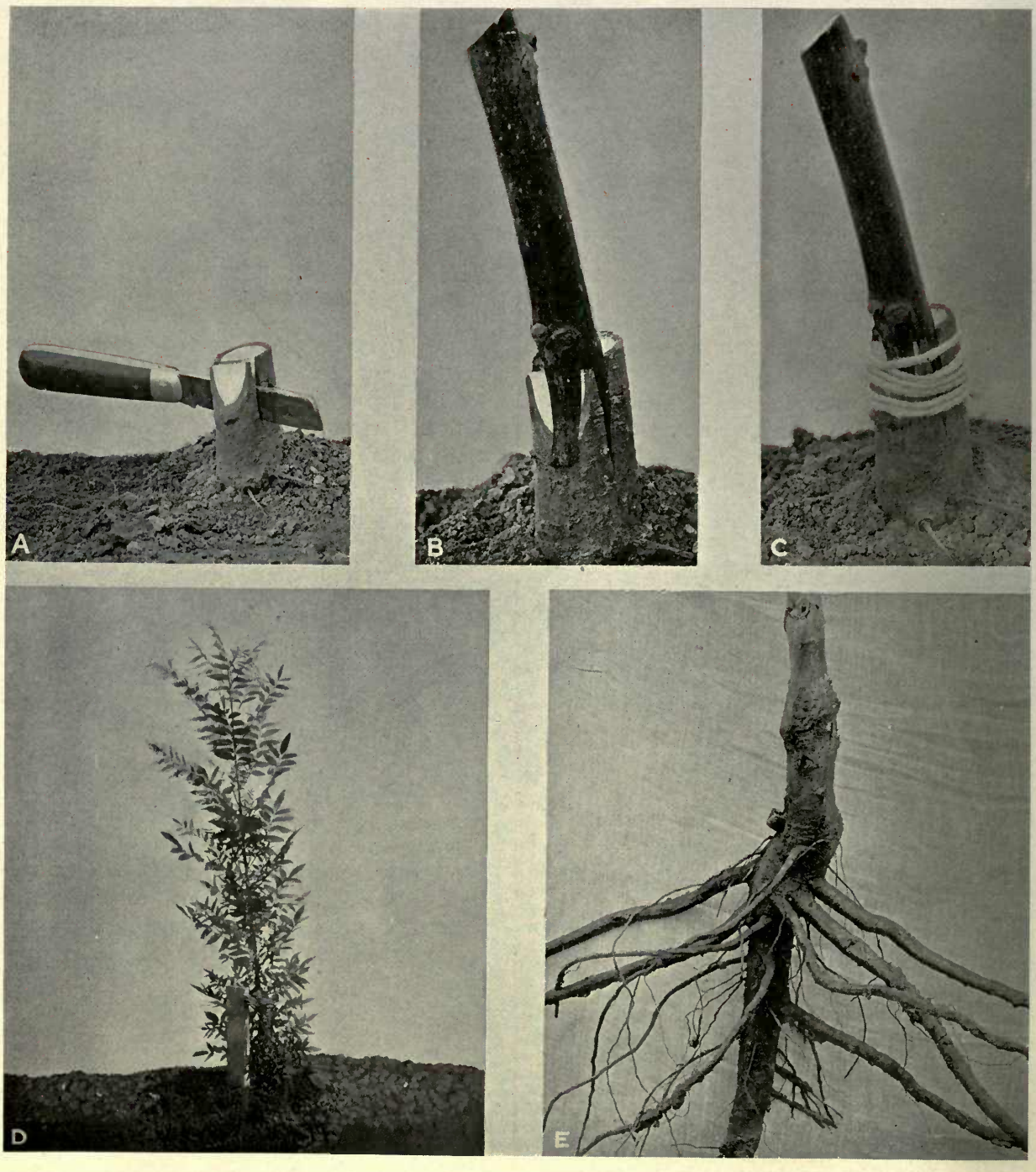
The black walnut for rootstock is grown from seed in the nursery for a period of one year. Just before the leaves start to emerge in the spring, the one-year-old seedling is grafted to the desired variety of California walnut, a short whip graft generally being used. The union is made fast with cotton twine or raffia, and hot wax is applied to the graft and scion-tip to prevent drying. The danger from drying out is further safe-guarded against by covering with paper or hilling up with soil. The young trees resulting are trained to stakes as a support for their supple growth. The tree is usually grown in the nursery one year from time of grafting, at which time it is from six to twelve feet high and ready for transplanting. The demand for good trees fluctuates from year to year, but the past two years have been profitable to the walnut nurserymen because demand has exceeded the supply.

ROOTSTOCKS

THE general requirements for a rootstock are that it produce a vigorous, healthy, and productive tree under varied conditions. The Persian walnut as a rootstock itself has been discarded because it does not live up to these requirements. The various species of the black walnut are used entirely for commercial rootstocks. The northern California black *(Juglans hindsii)* is considered with the most favor. It produces a strong, vigorous tree which will withstand adverse soil and moisture conditions to a profitable degree. This species is a native of northern California and is easily obtained.

The southern California black *(J. californica)*, though once popular, is little used at present, due to the fact that it produces a less vigorous root system than the northern species and starts growth earlier in the spring than the Persian walnut, thus causing profuse suckering. Trees planted to this species are inclined to tip over when subjected to strong prevailing winds.

The Eastern black *(J. nigra)* is little used, since it produces a less vigorous tree than the



NURSERY PRACTICES: (A) MAKING THE CLEFT. (B) THE SCION UNITED WITH STOCK. (C) TIED AND READY FOR WAXING. (D) A NATIVE SEEDLING BEFORE GRAFTING. (E) A NURSERY-GRAFTED TREE, DISPLAYING GOOD UNION AND EXTENSIVE ROOT SYSTEM

A WALNUT NURSERY, SHOWING NATIVE SEEDLINGS IN THEIR FIRST SUMMER

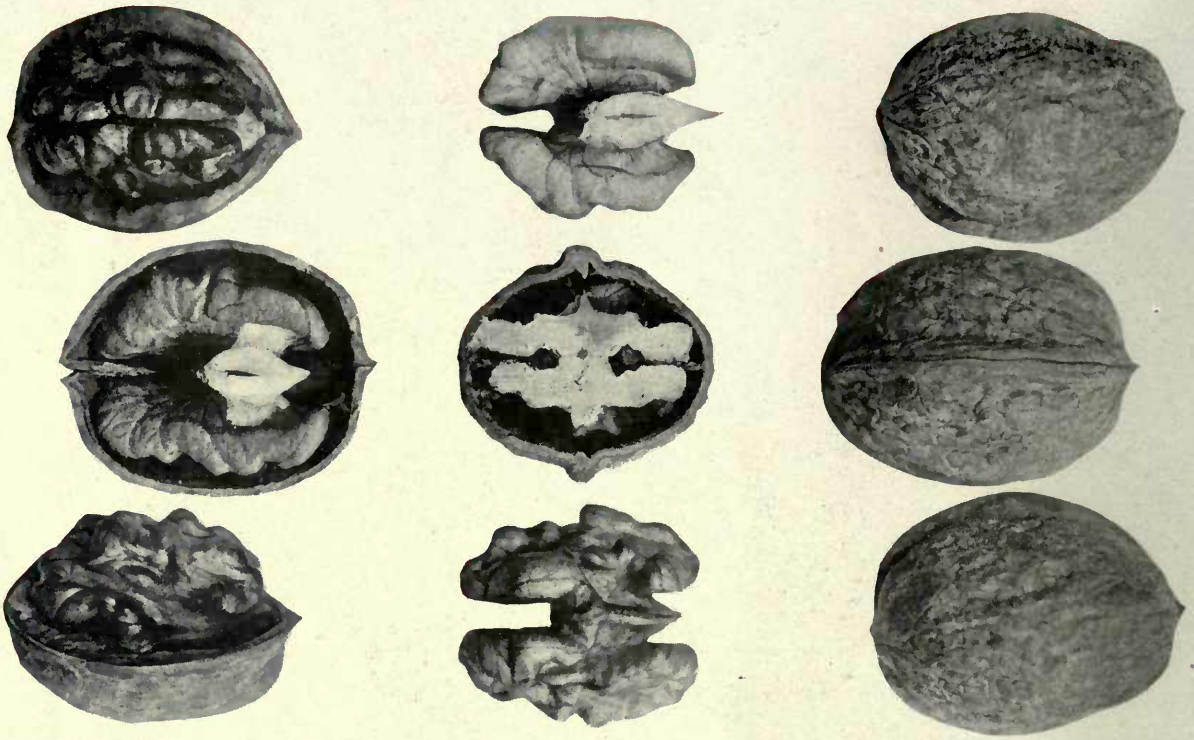
California species. Some nurserymen advocate the use of the Royal Hybrid, the name commonly given the cross between Eastern black and either of the California species. This stock gives a strong-growing tree, supposedly resistant to excessive soil moisture and other unfavorable soil conditions.

Paradox Hybrid, which is a first-generation cross between the Persian walnut and any of the "blacks," makes an exceptionally large and vigorous growth and in respect to merit as a rootstock is unsurpassed. However, it is impractical from the nurseryman's viewpoint, as it is difficult to obtain in wholesale quantities.

VARIETIES

ORIGINAL walnut plantings in California were of hard-shell seedlings. These were later superseded by the Santa Barbara soft-shell seedlings, of which a large acreage is still producing. Most of the plantings which have been made in the last ten years are of the budded varieties, of which the Placentia is the most popular. The Eureka has gained considerable prestige since its comparatively recent introduction and has been more extensively planted than any other variety (except the Placentia) in all southern California localities. It is safe to say that the planting of these two varieties during the past few years more than equals the plantings of all other varieties combined for the same period. In the central and northern California counties the Franquette, Mayette, and Concord varieties predominate and are perhaps better suited to the northern climatic conditions.

The Placentia is of the Santa Barbara soft-shell type. It has an attractive, well-formed, thin shell, with a plump meat of pleasing appearance, excellent quality, and exquisite flavor. The proportion of meat to the entire weight of the nut is high, running 50 per cent



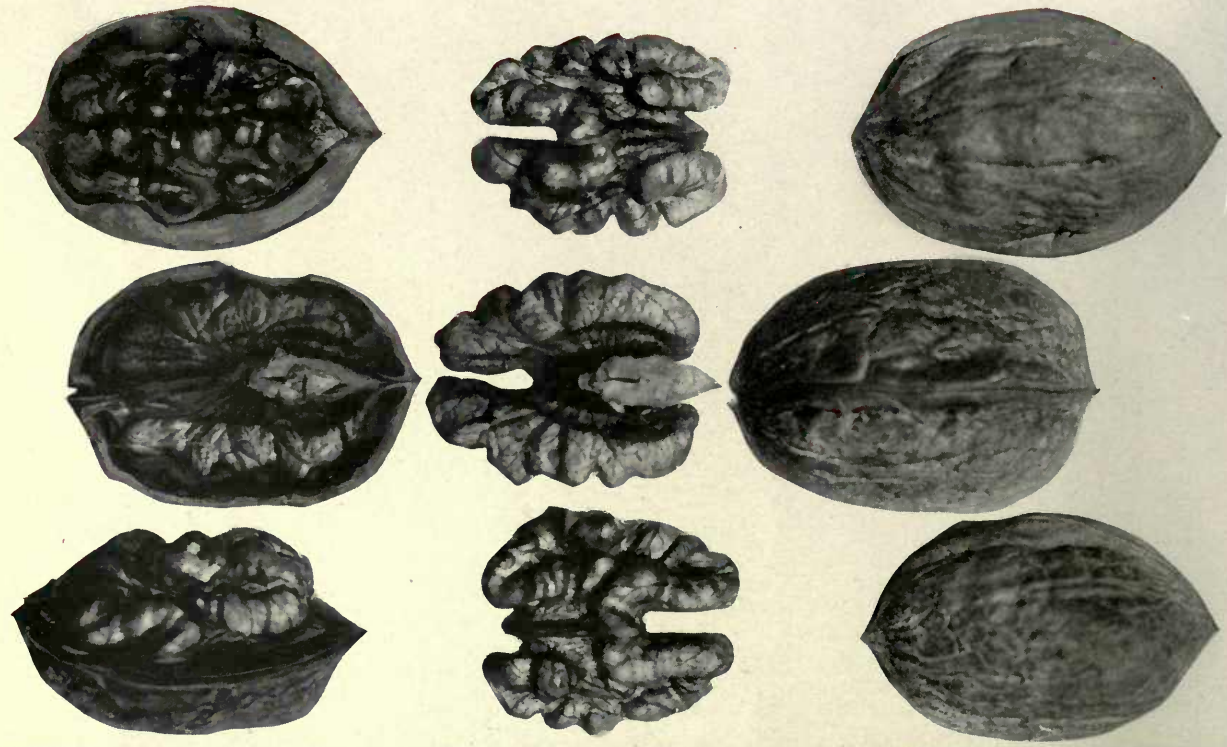
PLACENTIA, ACTUAL SIZE

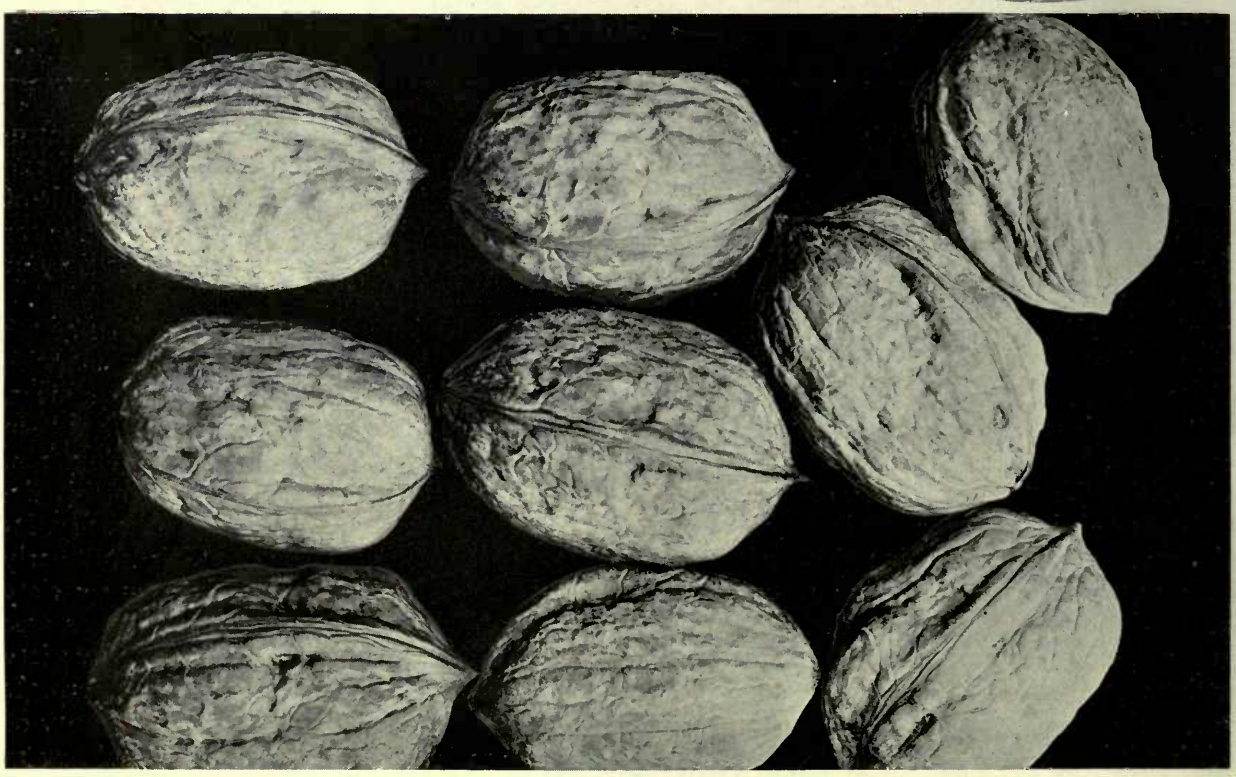
EHRHARDT

and over. The tree is easily propagated, a vigorous grower, precocious, and is very productive. Its good quality and extreme productivity are sufficient to rank it high in the list of varieties. From all points of view it is considered the most profitable variety for southern California. This variety is susceptible to blight; no more so, however, than the Santa Barbara seedlings.

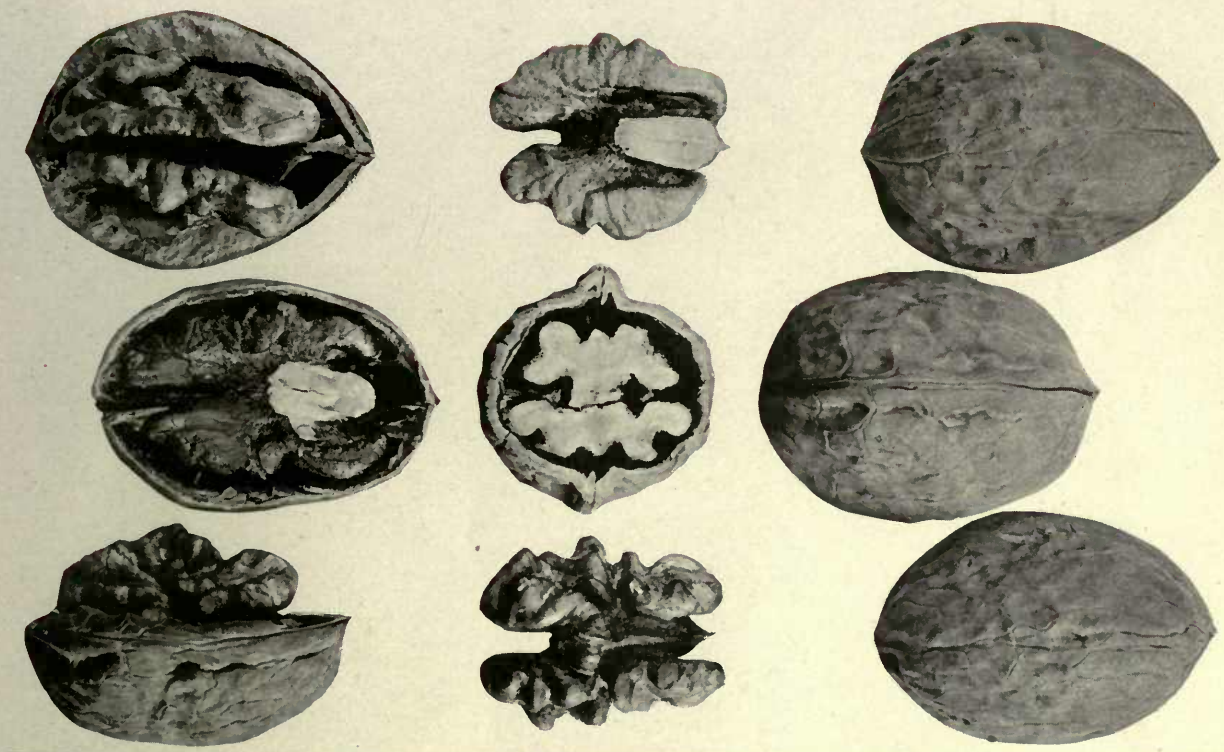
The Ehrhardt is a newly introduced variety which has all the characteristics of the Placentia with the added merit of being more resistant to blight. In the one instance, where observation has been possible, this variety has been nearly free from blight; whereas the Placentia and seedlings of the same age, grown beside it, have been badly affected with the disease. The quality, cracking average, and general attractive appearance of the Ehrhardt is higher than that of the Placentia. The Association's Field Department has helped distribute trees of this variety to the growers in various walnut sections for comparative trial planting with the Placentia and Eureka, and it is expected that the result of these trials will place the Ehrhardt above the Placentia and make it the leading variety of southern California.

The Eureka is an attractive walnut of the highest quality. It is a large oblong nut with handsome well-sealed shell, attractive meat, and excellent flavor. In the south it has been slow to come into bearing, but, judging from the original tree, it makes up for this deficiency by heavy production at maturity. Its tendency toward late blooming and early ripening makes it a very satisfactory variety for northern planting. It is at least as free from blight as any other established variety and is generally healthy and vigorous. It does best on a good rich soil, where plenty of moisture is available, but has a tendency to form imperfectly developed meats. To offset this tendency an extra irrigation should be

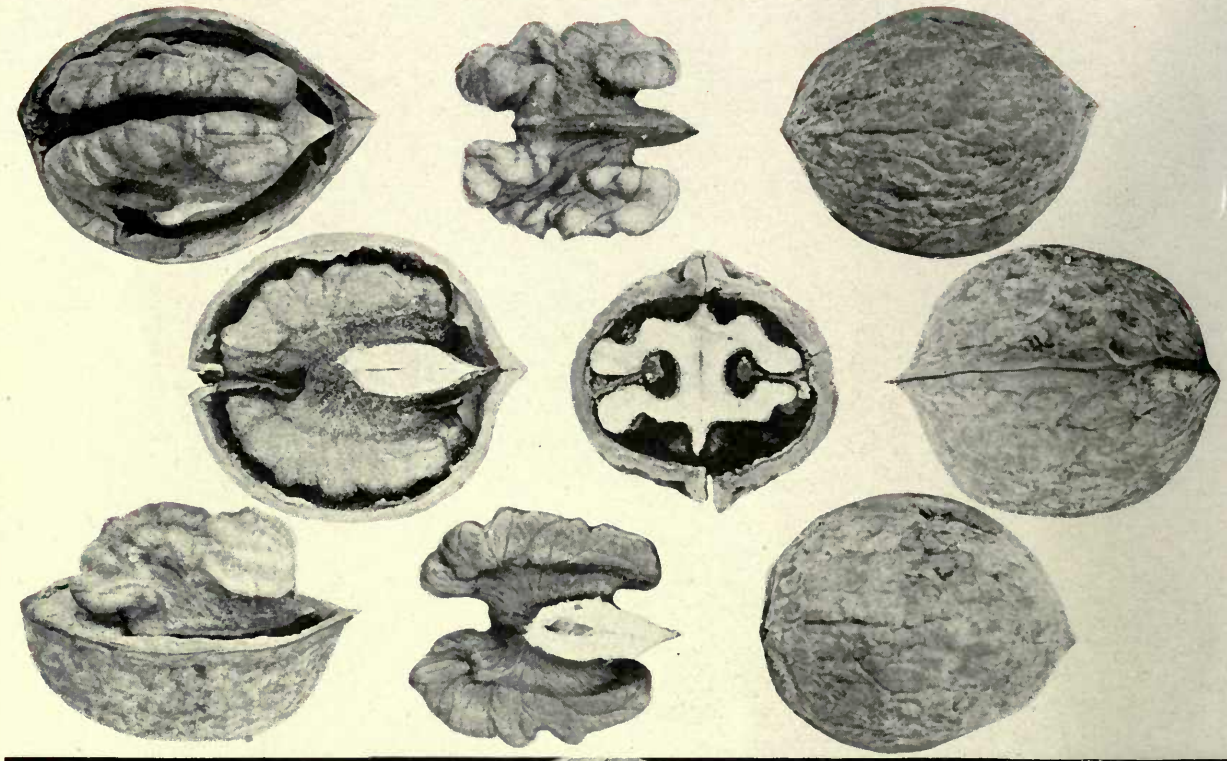


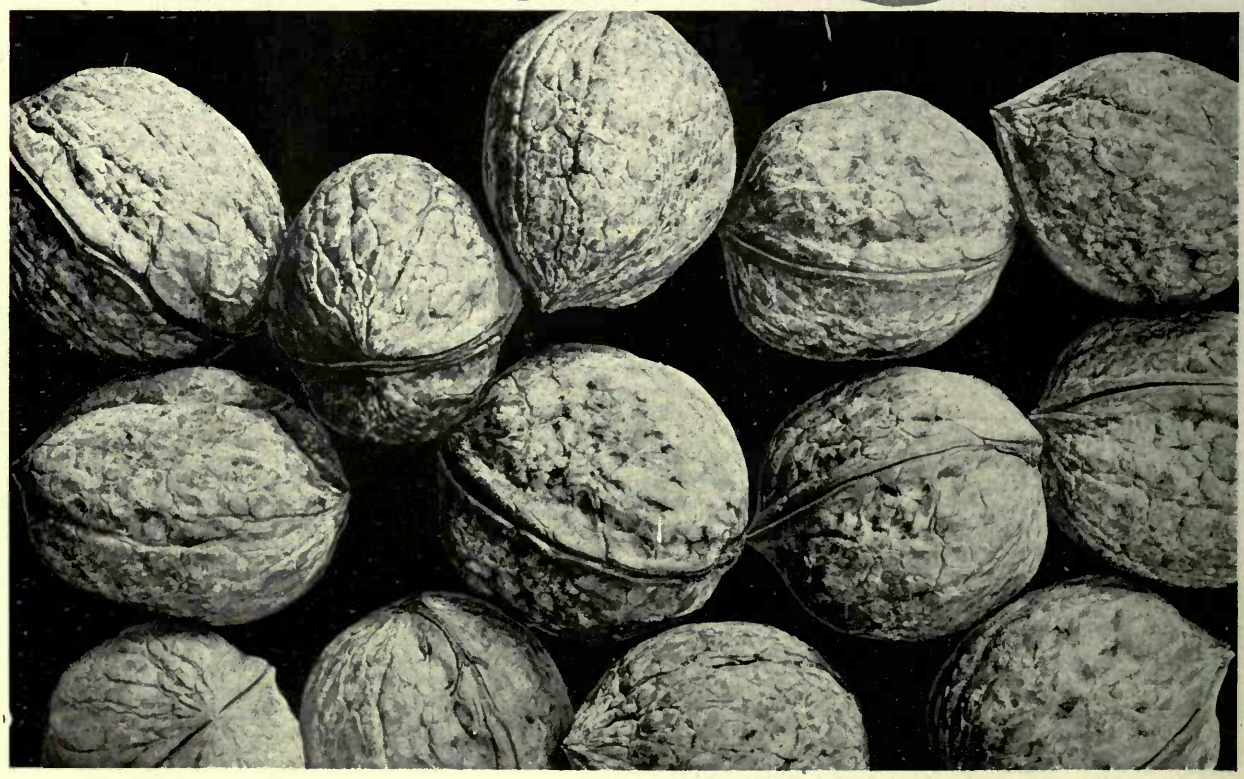


EUREKA, ACTUAL SIZE

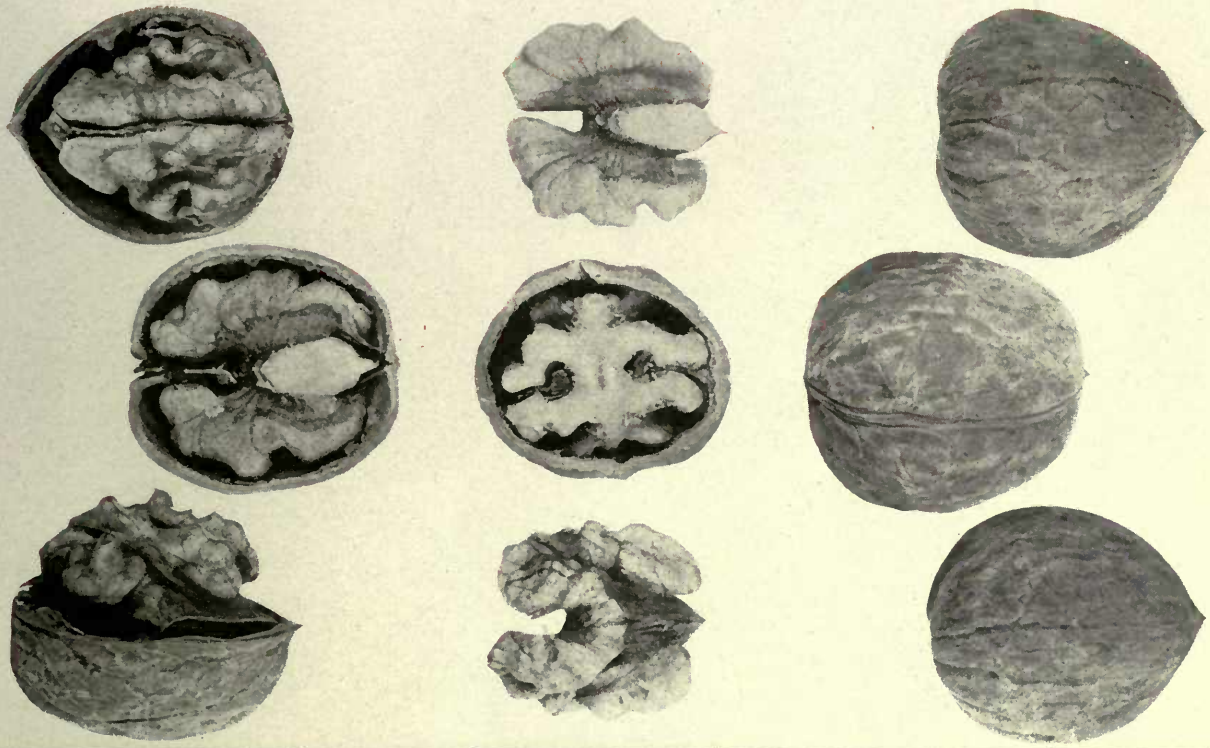


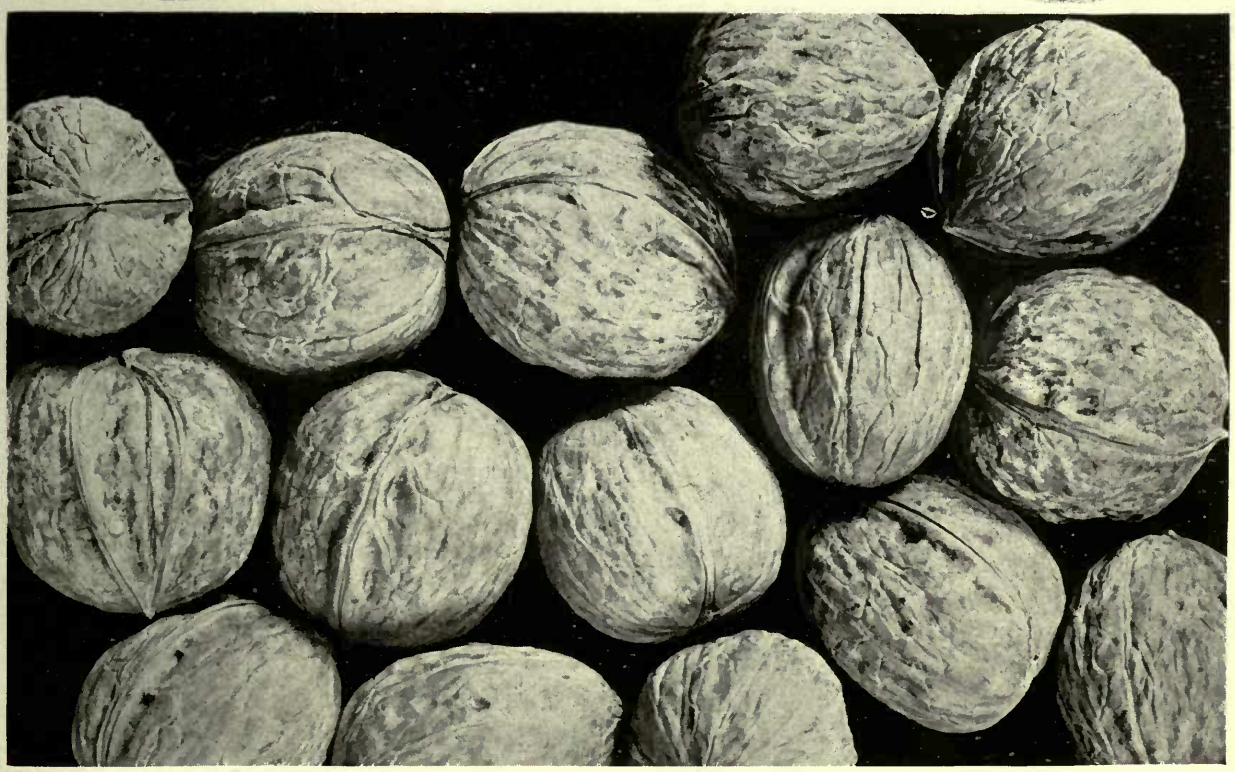
FRANQUETTE, ACTUAL SIZE



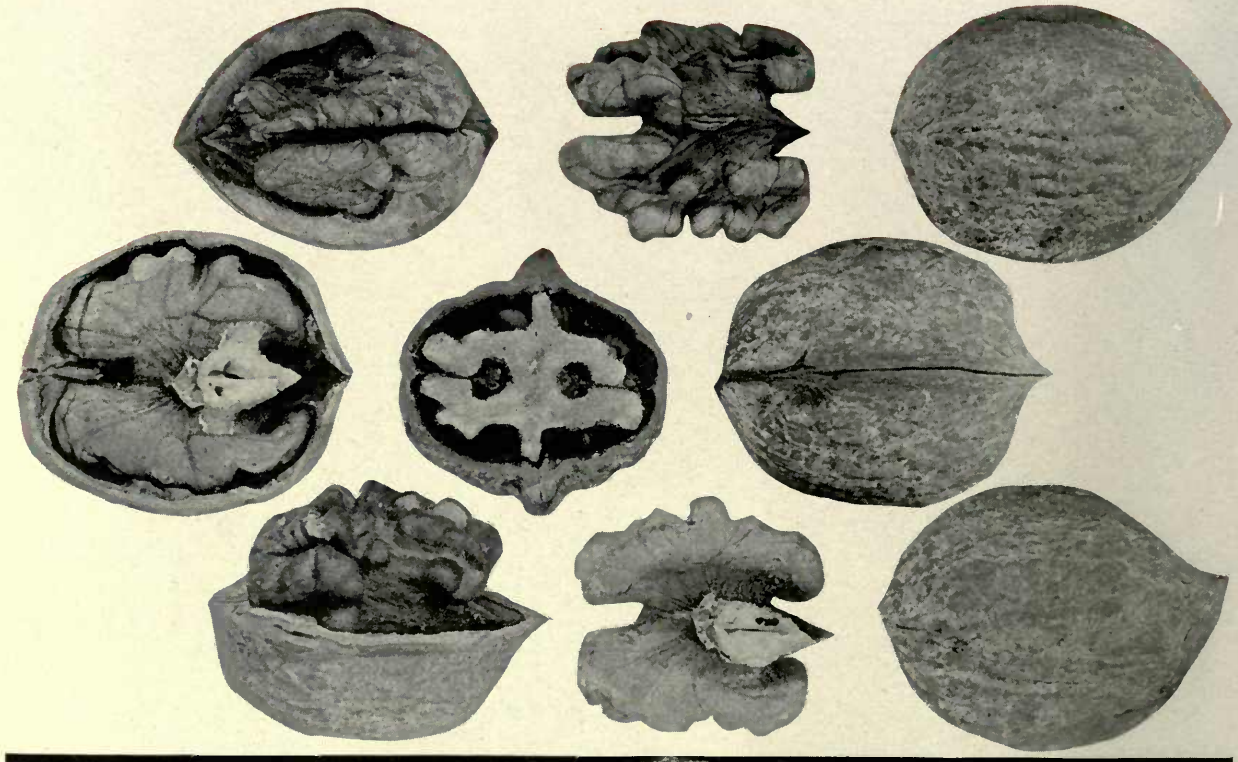


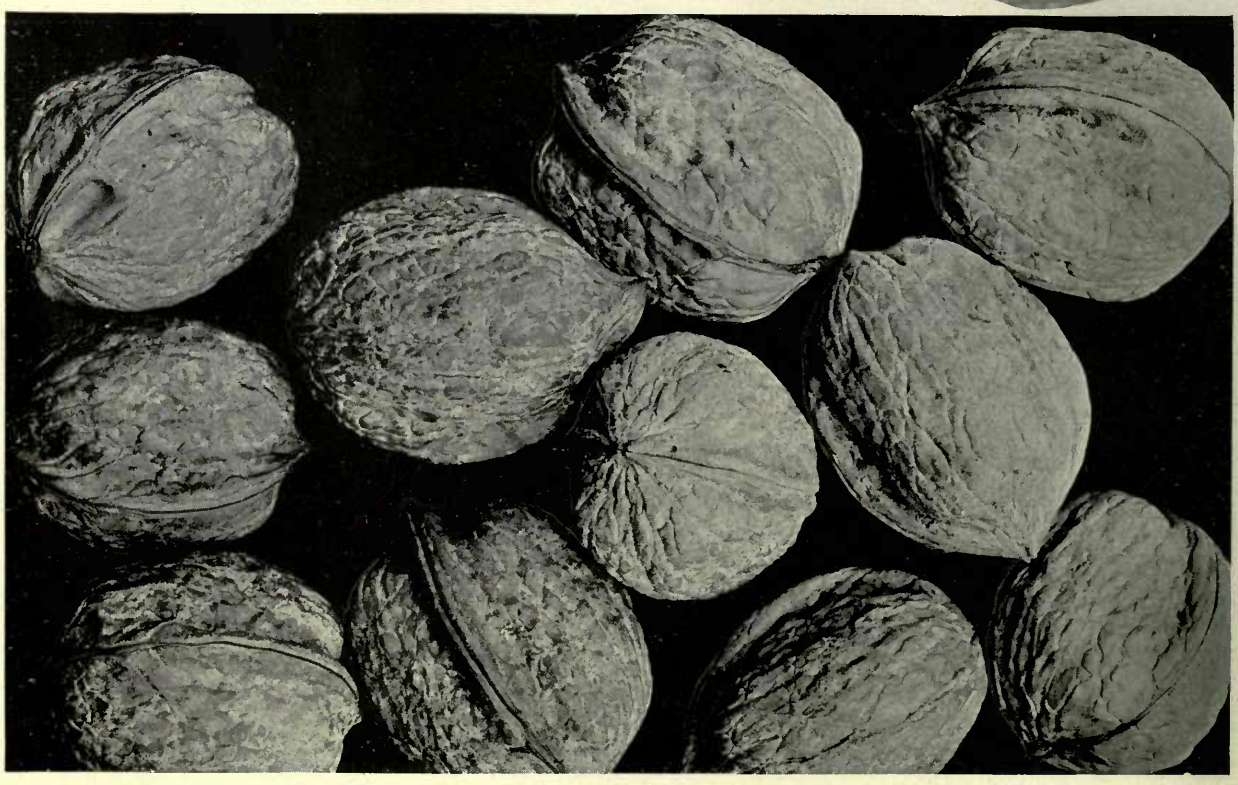
CHASE, ACTUAL SIZE



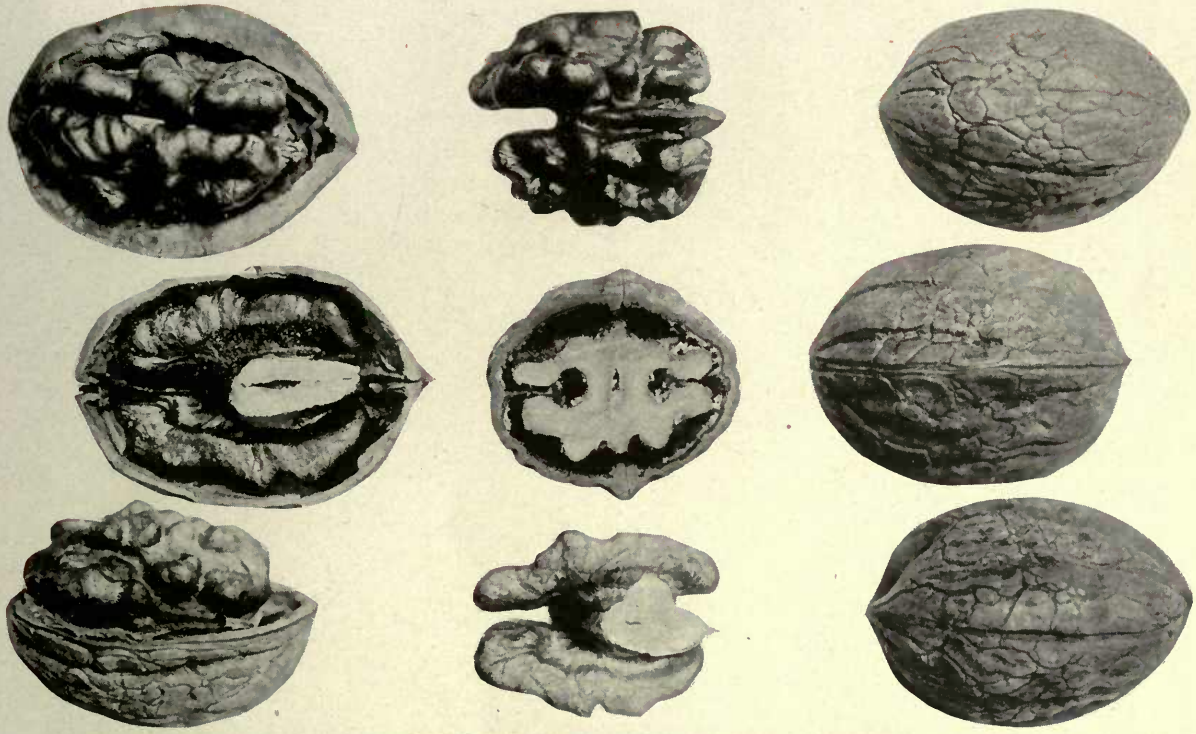


CONCORD, ACTUAL SIZE

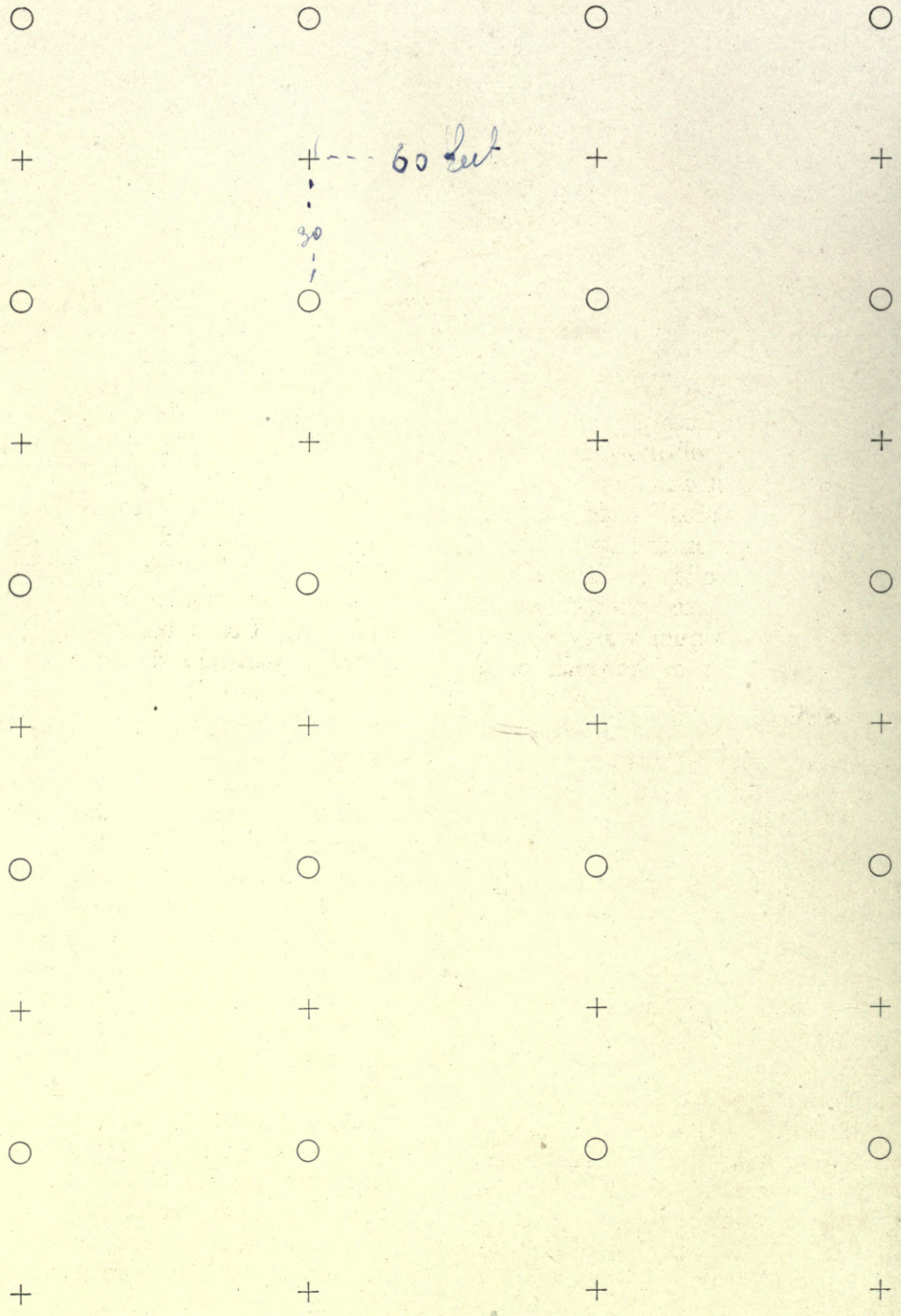




NEFF, ACTUAL SIZE



(ABOVE) PROLIFIC, ACTUAL SIZE. (BELOW) SAN JOSE, ACTUAL SIZE



EARLY-BEARING VARIETIES AS FILLERS

○ LATE-BEARING VARIETIES — ROWS 60 FEET APART

+ EARLY-BEARING VARIETIES — TREES 30 FEET APART

PERMANENT TREES 60 FEET BY 60 FEET

applied toward the latter half of August or early September.

The Prolific, Chase, El Monte, Concord, Neff, Payne, and a few other varieties are producing profitably in various walnut sections of California, while the French varieties, chiefly represented by the Franquette and Mayette, are a source of profit in regions of short growing season. All of the varieties named are good commercial nuts, each one possessing certain qualities in which it surpasses its rivals.

LOCATION BEST FOR WALNUTS

SUCCESS with walnuts depends upon soil, climatic and soil-moisture conditions. The soil best adapted is a good loam with plenty of humus. Although this crop is profitably grown on the lighter soils with silt or loam subsoils, it favors the heavier loams. Groves planted on light sandy soils are a source of continual worry. Those with an underlying layer of hardpan or a fluctuating water-table within 5 or 6 feet from the surface, are short-lived. Although good drainage is imperative, irrigation is necessary in most sections for the best results.

While there are walnut varieties which produce in localities of short season and low winter temperature, the most favorable location for commercial walnuts is one of long growing season and moderate winters. Add to this a relative high humidity, and you have an ideal location for walnut plantings. Favorable climatic conditions must, of course, be supplemented with adequate water supply.

The industry has developed faster throughout the coast regions but recently has spread to the interior. The high humidity and small daily range of temperature prevalent in the coastal sections are apparently more favorable to this crop, especially to the varieties of the Santa Barbara soft-shell type. Other varieties are being developed by the Field Department of the California Walnut Growers Association which may be better suited to the climatic conditions of the inland sections. Inland plantings are less subject to blight than those of the humid coast regions.

PLANTING THE GROVE

IMPORTANCE is attached to the tree obtained for planting purposes. A stocky tree of from 6 to 10 feet in height, of good diameter and a vigorous, healthy root system, should prove satisfactory. Such trees can be obtained from nurserymen at a cost of from $1.00 to $1.50 apiece. Good trees, even at a higher cost, prove the cheapest in the end. Trees are usually headed back to 5 or 6 feet at planting.

Trees of the present plantings range from 40 to 60 feet apart, but experience has proved that a distance of 60 feet between trees gives the best results. The walnut makes a vigorous growth, and if planted closer than 60 feet the trees will crowd when mature, the sunlight is excluded from a large portion of each tree, and the bearing surface materially reduced. This results in a reduction of crop. This contention is borne out by the fact that in closer plantings the outside trees bear appreciably more than those inside the grove where the sunlight is excluded. Actual comparisons by the Field Department of the California Walnut Growers Association between crops from close and distant plantings prove that though more distant plantings (60 by 60 feet for permanent trees) are more profitable in the long run, the returns from 60-foot permanent plantings are increased by planting the rows 60 feet apart and the trees 30 feet apart in the rows, with the intention of removing every other tree in the row when they begin to crowd. In localities where such varieties as the Eureka and Franquette do well, it is advisable to plant these less precocious varieties 60 by 60 feet with varieties such as the Placentia and Ehrhardt, which come into profitable bearing five or six years after planting, as fillers in the rows. When the proper time arrives the early-bearing varieties can be removed, leaving a good 60-foot planting of the desired type. This practice is followed with very satisfactory results. Some growers even plant 30 by 30 feet with the intention of removing first every other row and later every other tree. This practice can

(ABOVE) THE NECESSITY OF DISTANT PLANTING BECOMES APPARENT WHEN THE TREES ARE FULL GROWN
(BELOW) A CALIFORNIA WALNUT GROVE IN CLEAN CULTURE

only be recommended if the grower will have the moral courage to remove the trees at the proper time, or if the soil is strong enough to support the added trees profitably. In the majority of cases, the grower hasn't the moral courage to remove the trees when the time comes.

Interplanting with deciduous fruits is practiced in some sections, but usually to the disadvantage of the walnut but with possible profit to the grower.

CULTIVATION

SATISFACTORY method of soil handling is most prevalent where clean culture is combined with winter covercrops. Such crops as Melilotus clover, purple vetch, and horsebeans make good covercrops if properly handled. These leguminous crops add nitrogen to the soil and improve its mechanical condition. The covercrop is usually planted immediately after harvest and plowed under to a good depth during the latter part of March or in April. The soil is well broken up with disk and harrow and kept in good tilth throughout the summer.

INTERCROPPING

WITH the present practice of distant planting in vogue, intercropping is resorted to as a means of supporting the walnuts before they come into profitable bearing and increasing the profitableness of older groves. In localities where beans do well, interplanting with this crop has proved very advantageous and remunerative. Good returns are derived from the beans, and at the same time the beans, being a leguminous crop, add nitrogen to the soil. The straw plowed under, and even the bean roots, add humus to the soil and improve its mechanical condition. The cultivations given intercrops benefit the trees as well.

On a strong soil, where plenty of irrigation water is available, intercropping with winter vegetables such as lettuce and cabbage has proven a desirable practice. The use of corn or other grains as an intercrop is absolutely unsatisfactory, as these intercrops draw too much nutriment from the soil, and alfalfa is only to be recommended where abundant water is available for irrigation purposes. If alfalfa is used as an intercrop, A GOOD DISTANCE OF CULTIVATED GROUND SHOULD BE LEFT BETWEEN THE INTERCROP AND THE TREE ROWS, and this cultivated strip kept well irrigated.

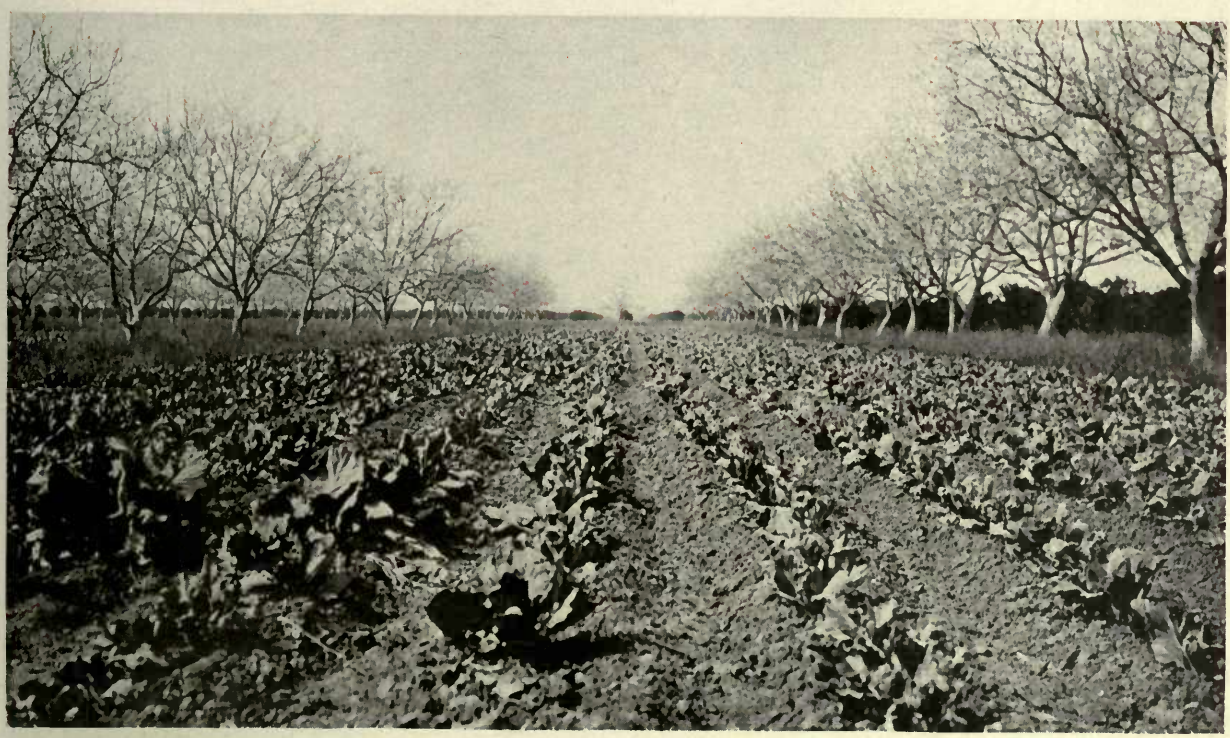
IRRIGATION

IRRIGATION water is applied to the trees by the use of the furrow system in most cases. In a few instances the basin system is resorted to. Each irrigation should penetrate 5 to 8 feet from the surface to reach the entire root system. Time, amount, and frequency of irrigations depend upon rainfall, climatic conditions, and water-holding capacity of the soil. Two to five irrigations are given. They are usually applied in May, June, July, and August, when the nuts are being formed and matured. The best irrigation practice includes an irrigation in the middle of the dormant season, as early as January or the fore part of February. January irrigation is particularly necessary in years of light rainfall. If the rainfall before the first of the year has not come up to normal, a January irrigation will prove good insurance against a possible drought. Winter irrigation lessens the possibility of winter injury and assures an early and steady growth in the spring. An irrigation a week or two before harvest facilitates the opening of the shucks at harvest-time. An additional irrigation is sometimes given in the fall after the leaves are off the trees, to put the trees in good condition for the winter and thus reduce the danger from winter injury. From 12- to 24-acre inches are applied throughout the year. Some growers apply as high as 30-acre inches.

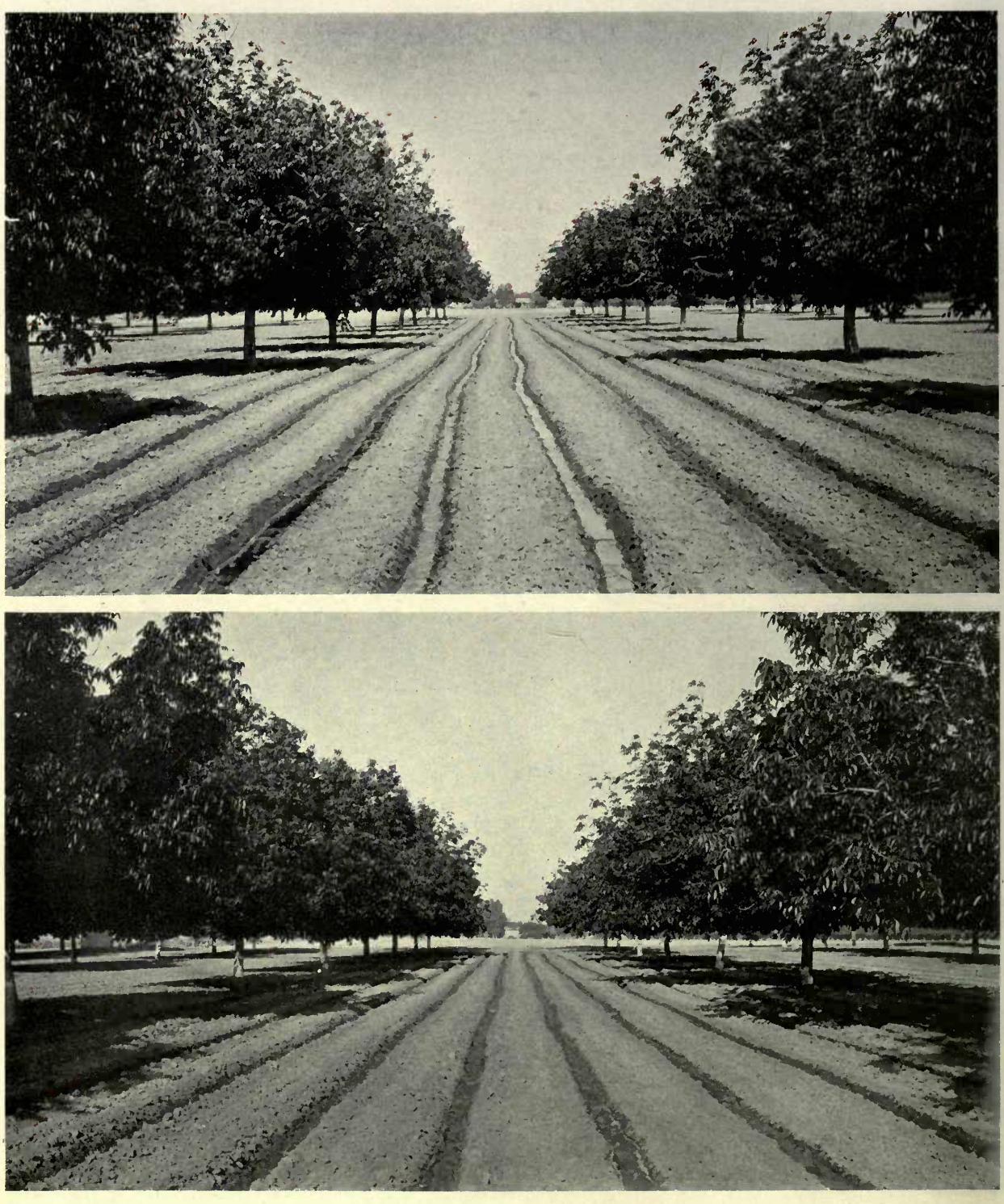
PRUNING

A SMALL amount of pruning is practiced, usually no more than the removal of the lower branches which interfere with cultivation. A certain amount

(ABOVE) A LEGUMINOUS COVERCROP READY TO BE PLOWED UNDER
(BELOW) THE TRACTOR IS BEING USED TOADVANTAGE IN WALNUT CULTIVATION



(ABOVE) WINTER CABBAGE AS AN INTERCROP; A GOOD PRACTICE ON STRONG SOIL WHERE AN ABUNDANCE OF IRRIGATION WATER IS AVAILABLE
(BELOW) LETTUCE AS AN INTERCROP



(ABOVE) IRRIGATION IN PROGRESS
(BELOW) IMMEDIATELY AFTER IRRIGATION. IRRIGATING WALNUT TREES BY MEANS OF THE FURROW SYSTEM

THE LOW-HANGING LIMBS ARE PRUNED OFF TO FACILITATE ORCHARD OPERATIONS

of thinning is beneficial, since it exposes a greater surface to the sunlight and increases fruitfulness. However, to date, no special system of pruning has been developed; but experiments which will definitely settle the matter of pruning are being carried on in the principal walnut-growing sections by the Field Department of the California Walnut Growers Association. All the known types of pruning are being practiced, and the resulting yields and vigor of tree recorded. The merits of the various pruning methods will, in this manner, be determined on a practical basis and the grower apprized of the best practices to follow, with the benefits he may expect as a result of his labor.

FERTILIZERS

AS a general practice throughout the walnut industry, fertilizers have been confined to the use of barnyard manure. This practice is commendable, as it adds humus to the soil, makes it more porous, and thus increases its power of water-absorption and retention. It also adds nitrogen in a form available for plant use. The same results are obtained by plowing under leguminous covercrops.

Commercial fertilizers have been tried out in a few instances, but with indifferent success.

From the table on page 40 it will be seen that the walnut removes a smaller amount of the principal plant-food elements from the soil than other fruit crops.

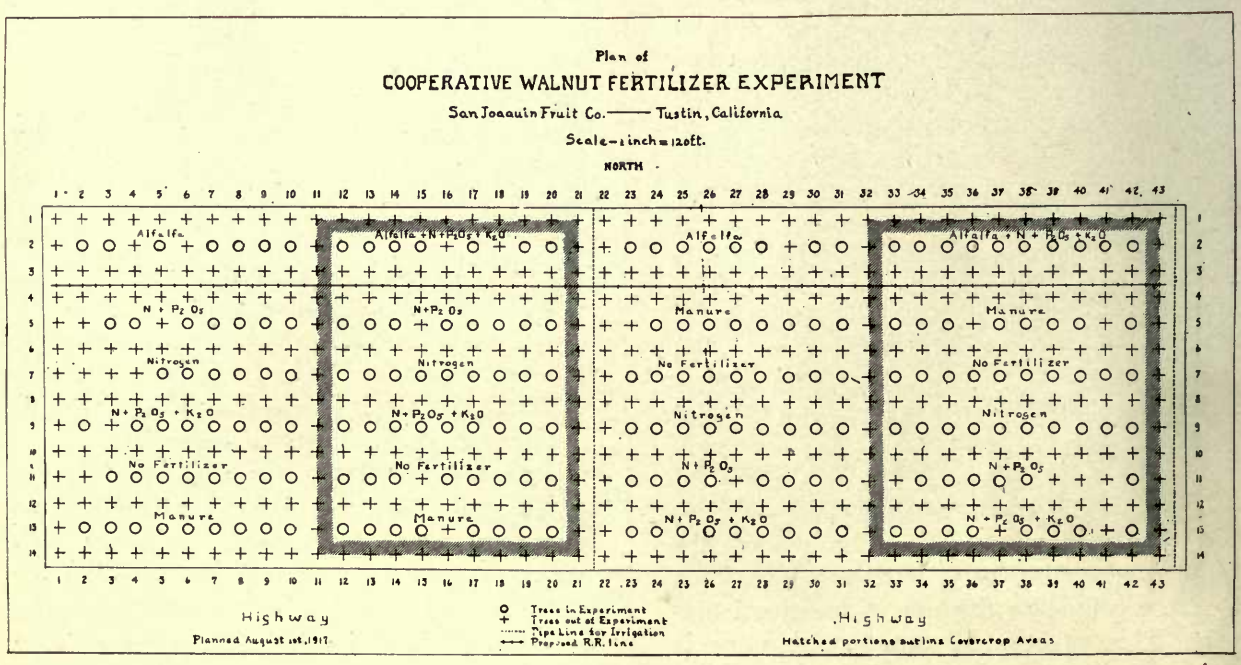
These figures indicate that the walnut is not as exacting in its fertility requirements as other tree crops. However, the actual extent of its fertility demands is not yet known. Two years ago the Field Department of the California Walnut Growers Association, in cooperation with the University of California, commenced investigations along these lines:

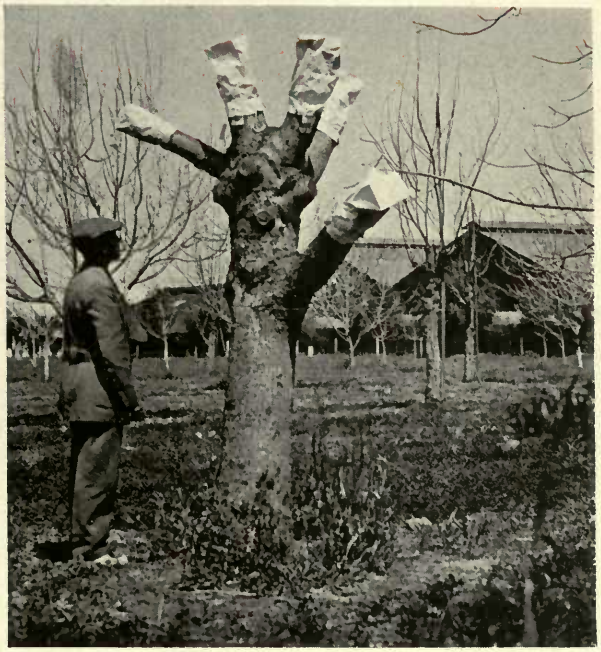
PLANT FOOD ELEMENTS WITHDRAWN FROM THE SOIL BY FRUITS*

(EXPRESSED IN POUNDS PER ACRE)

Fruit	Amount of Crop	Nitrogen	Phosphoric Acid	Potash
Oranges	16,300 lbs.	28.23 lbs.	8.63 lbs.	34.39 lbs.
Lemons	18,900 "	28.53 "	11.52 "	50.84 "
Apricots . . .	10,000 "	19.73 "	6.40 "	29.00 "
Walnuts . . .	1,000 "	10.20 "	2.78 "	1.50 "

*Production from Dean Hunt of the University of California. Analysis by Colby in California Station Report of 1892 to 1897





(LEFT) CHANGING THE VARIETY OF A PERSIAN WALNUT, SHOWING THE LIMB STUBS WITH SCIONS INSERTED. THE TRUNK IS WHITEWASHED TO PROTECT IT FROM SUNBURN. (RIGHT) PAPER BAGS ARE PLACED OVER THE NEWLY-INSERTED SCIONS TO PROTECT THEM FROM SUN AND DAMPNESS

At present three separate fertilizer projects are being carried on in Tustin, El Monte, and Santa Paula, respectively. Each of these experiments comprises a planting of from 30 to 50 acres, divided into plots, each of which is given a different kind and amount of fertilizer. Check plots are maintained which are given no fertilizer. The complete fertilizer used for mature trees in these experiments consists of 30 pounds of dried blood, 21 pounds superphosphate, and 8.4 pounds of potash per tree annually. In the plots treated with barnyard manure 30 cubic feet of manure per mature tree is applied annually. An exact record of growth and production of each tree in the experiment is kept.

With the continuation of these experiments, the Association's Field Department will eventually be able to inform the growers of the exact economic benefits to be derived from the use of various fertilizers, and the amounts to use in order to get the maximum results.

TOP-WORKING

TOP-WORKING is often resorted to for the purpose of changing varieties and even species of the walnut. Young and mature native "blacks" are often grafted to the California walnut with the result of converting a merely ornamental tree into a commercial producer. Many of the old seedlings have, by grafting, been made to produce the better nuts of the budded varieties.

Top-working is best accomplished in January and February, when the tree is dormant. Four or five limbs, located so as to make a strong and well-balanced tree, are cut off about one foot from the trunk. Usually two cuttings are required to get a good smooth surface without splitting. A modified "cleft graft" is used, three to four diagonal splits being made around the circumference of the smooth-surfaced stub, extending about two inches each way. This split is forced open with a wedge, and a scion of two or three buds, tapered gradually and regularly to a

(LEFT) AT THE END OF THREE MONTHS' GROWTH THE TOP-WORKED TREE IS LARGE ENOUGH TO REQUIRE ARTIFICIAL SUPPORT FOR ITS BRANCHES. (CENTER) THE RESULT OF TWO YEARS' GROWTH. (RIGHT) A NATIVE BLACK TOP-WORKED TO THE EHRHARDT VARIETY AT THE END OF THE SECOND YEAR'S GROWTH

wedge, is inserted. The cambium layer, or sapwood, of the scion and stub must be in contact. The scion is cut with a bud at the vortex of the wedge, and, in placing, this bud should be level with the surface of the stub. Wood for scion purposes is preferably of the previous season's growth, and must be compact, healthy, and in good condition. Care must be taken to keep the scion wood moist between time of cutting from the parent tree and time of use in grafting.

After the scion is inserted properly the wedge is removed, soft twine is bound around the stub near the top to secure the scion, and the stub, scion-tip, and all exposed sapwood painted with wax. The wax is applied hot and forced with a brush into all cracks and crevices. The scions are then covered with paper bags to protect them from the sun, moisture, and wind. These bags are removed shortly after the scions commence growth. The stubs must be waxed at subsequent intervals until the union is well established.

The formula used by the California Walnut Growers Association's Field Department for the making of grafting-wax consists of:

Resin	4 pounds
Beeswax	1 pound
Raw linseed oil	1 pint

DISEASE AND INSECT PESTS

THE walnut tree suffers little from the ravages of disease and insects, compared with citrus and deciduous fruits, and the expense required to combat such troubles is small. However, there are a few maladies which must be taken into consideration.

Of these, *walnut blight*, or bacteriosis, is by far the most important—so important in fact that the loss of a fourth of the crop in

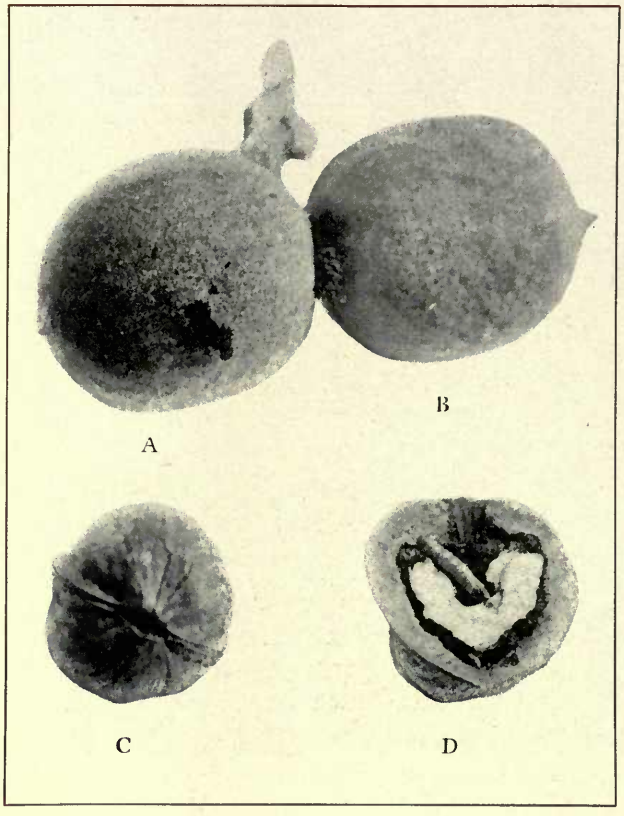
DEMONSTRATING THE USE OF THE DUSTING MACHINE FOR CONTROLLING THE WALNUT APHIS

certain years has been attributed to it. It is a bacterial disease which attacks the young and tender growth and spreads to the more mature wood, causing the affected areas to turn black and die. Under favorable conditions the disease is especially destructive to the nuts. If it attacks the nuts early in life, it causes them to turn black and drop off when one-eighth to one-half inch in size. It causes more mature nuts to remain undeveloped, and makes full-grown nuts unmarketable. It occurs on the nut as a black spot, most prevalent at the calyx end, but often scattered over its entire surface. Damage from blight is more prevalent in years of heavy fogs.

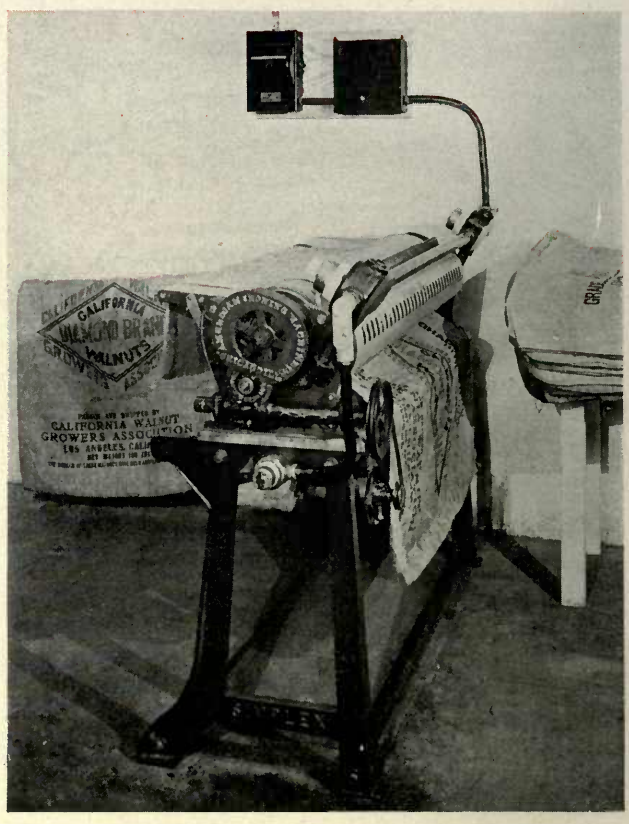
Although the growers themselves and the California Legislature have offered large rewards for a remedy, no method of control has been found. Certain walnut varieties have been developed which show a degree of resistance to the disease. With the introduction of these and the development of still more resistant varieties, it is hoped that the damage from blight can be greatly lessened.

On the insect side, the chief pest which the industry has had to combat is the *walnut aphis*. This is a small green plant-louse which feeds on the leaves and succulent shoots by sucking the plant juices and devitalizing the tree at a critical stage, thus causing less crop, lighter nuts, and imperfect meats. The foilage of a tree infected with this insect becomes covered with "honey dew," a sticky secretion which turns black upon continued exposure to the air. The damage caused by the aphis varies from year to year. In some sections the damage is considerable every year; in others it is only on exceptional years that the loss is heavy. The aphids usually disappear with the approach of extremely hot weather.

The latest method of control is by the use of a nicotin-dust preparation, applied by blower. The latest improved dusting-machine



(A) APPEARANCE OF GREEN NUT AFTER WORM HAS ENTERED ON OPEN SIDE. (B) CODLIN MOTH WORM USUALLY ENTERS GREEN NUT ON THE STEM END AS HERE SHOWN. (C) A ROUND OR OVAL OPENING ON THE STEM END OF THE CURED NUT IS ALMOST A SURE SIGN THAT THE WORM HAS PAID HIS RESPECTS INSIDE. (D) SECTION OF WALNUT SHOWING THE CODLIN MOTH WORM DOING ITS WORK



"THE MANGLE," A SPECIAL MACHINE RECENTLY INSTALLED IN THE LOS ANGELES HEADQUARTERS OF THE ASSOCIATION, IN AN ATTEMPT TO PREVENT THE SPREAD OF THE CODLIN MOTH THROUGHOUT THE STATE. SIXTY THOUSAND EMPTY DIAMOND BRAND WALNUT BAGS ARE BEING "IRONED OUT" BY THIS MACHINE THIS SEASON, THE IDEA BEING TO EXTERMINATE THE INSECTS BY HEAT AND PRESSURE

will treat 40 acres a day, applying 3 to 4 pounds of dust to the tree, at a cost for dusting material of 15 to 20 cents per tree. The dusting-machine proper can be purchased for $190.00.

The aphis can be controlled by the liquid tobacco spray, although the cost on extremely large trees makes it impractical. It has been demonstrated that ten-year-old trees can be sprayed for 30 cents a tree and mature trees for 40 to 50 cents per tree. Spraying is practical only when the aphis appears in alarming numbers, fifty or more individuals to a leaf.

The *codlin moth*, though a recent pest to the California walnut, has done considerable damage since 1916. The moth lays its eggs on the under surface of the leaves, and a larva, a small fleshy, light-colored worm of a pink tint, emerges. This larva penetrates the nut, usually where two nuts touch. A nut that has been penetrated by a worm is destroyed for eating purposes and becomes unmarketable. This insect is apparently the same as the codlin moth of the apple, and is subject to the same treatment, with revision of application. So recent is its occurrence that no control methods have been tried out, but it is known that arsenate of lead, Paris green, and other poisons will kill the insect. It yet re-

mains to determine the best method of application. Work along these lines is going forward rapidly through the medium of the University of California and the Field Department of the California Walnut Growers Association. Experiments are being carried on with the insect itself and methods for its control. Dusting, spraying, and banding are all being tried out from the viewpoint of both efficiency and economy.

Working on the hypothesis that the codlin moth was introduced into California by means of sacks used for shipment of nuts, and that the insect is spread by this means, the California Walnut Growers Association has installed a machine which irons out the sacks, killing the insect either by heat or pressure. Sixty thousand bags are being treated in Los Angeles this season.

Die-back, or winter injury, *little-leaf*, *perforation*, and *shrivelled meats* are all physiological difficulties that can be helped by the proper selection of soil and climatic conditions for a given variety, application of proper cultural methods, and accurate attention given to moisture conditions.

Sunburn causes much damage to trees of all ages. The bark cracks and promotes decay. The trees should be protected by paper protectors when small and painted with whitewash later.

Crown-gall is a bacterial disease which causes large galls at the crown of the tree, cutting off circulation and preventing proper nutrition. The tissue in the proximity of these galls becomes abnormal and easily succumbs to decay. There is no means of remedying the evil when once started. It can be avoided only by rigid inspection of nursery stock and controlled by removal of infected trees. It is probable that tree-surgery may save infected trees, but doubtful.

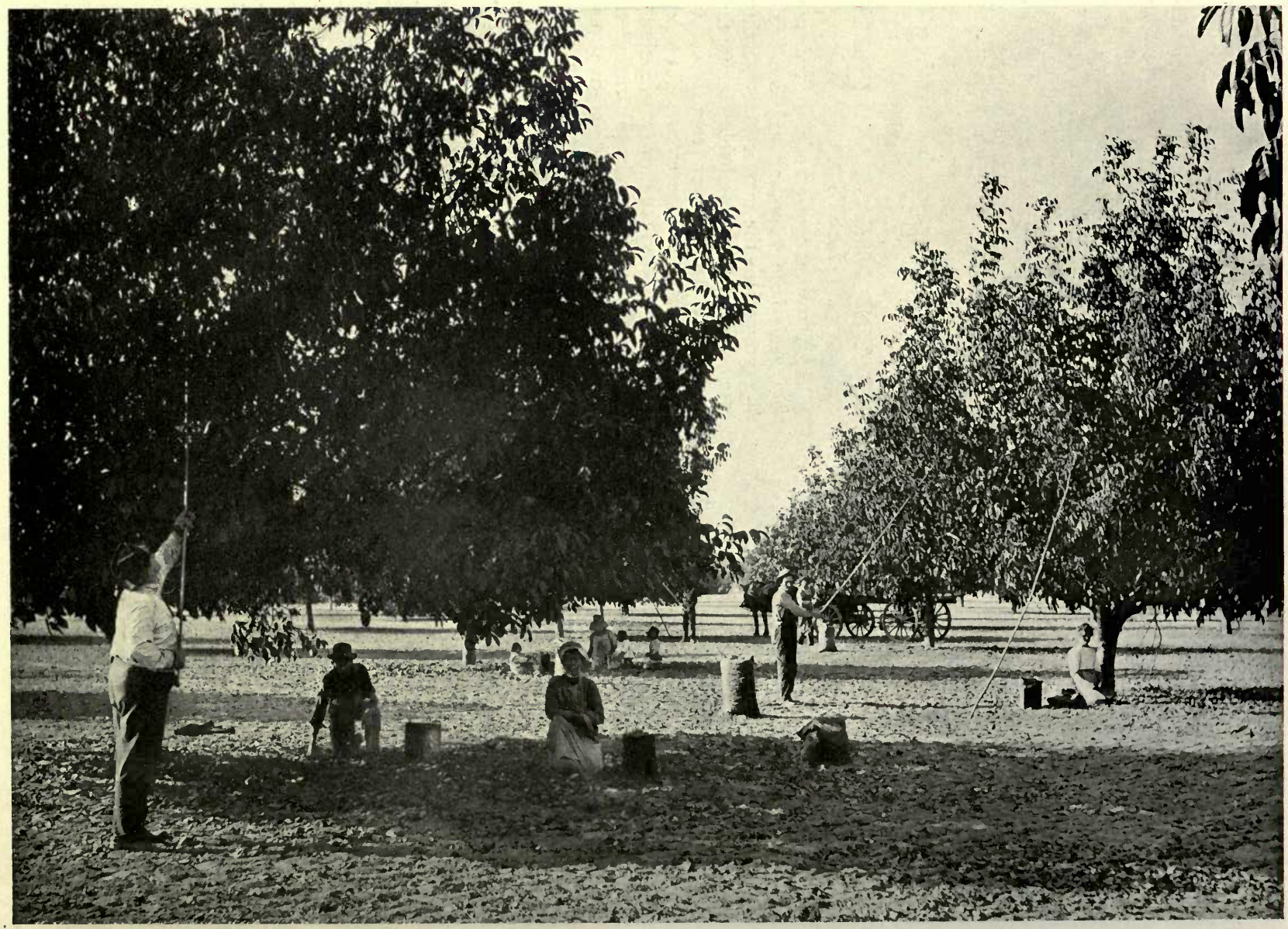
Melaxuma, though rare in most localities, does occur on the walnut. This disease causes cankers on the trees which exude a black sap. It is infectious, but can be cured by cutting out the cankers and painting with Bordeaux paste, followed by an application of asphalt paint.

Amalaria, or the so-called toadstool fungus, is of minor importance in the walnut industry, although it does occur in some sections. This fungus disease causes decay of the roots and is very infectious. No remedy is known, though it can be controlled to some extent by removing infected trees when discovered. With smaller trees, trenching around the roots of infected trees will prevent its spread, but with older trees, such is the extent of their root systems that trenching is impractical.

COMBATING DISEASE AND INSECT PESTS

THE walnut growers of California are behind the citrus- and deciduous-fruit growers in the matter of combating disease and insect pests, probably because the walnut has been much freer from these ravages in the past than the crops mentioned. However, it behooves the growers of walnuts to increase their efficiency in this regard to maintain this condition of comparative freedom from pests. Methods of control are available, but concerted effort is lacking. Progress in this matter would increase the profitableness to the individual as well as benefit the industry as a whole.

Realizing this laxity on the part of the growers, the Field Department of the California Walnut Growers Association devotes a large portion of its time to this phase of the industry. A close check is kept upon all walnut pests, and preventive methods and remedies recommended. All walnut ailments are investigated and given scientific attention. New remedies are tried out and perfected; old remedies are improved upon. As a result of the department's work, the latest and best scientific knowledge is carried direct from the research laboratory to the grower. With the continuance of this work it is hoped to put the walnut industry on a par with other California fruit industries in this respect, and save the growers in the future the large sum which is now being lost due to their indifference.



THE WHOLE FAMILY WORK IN THE WALNUT HARVEST

CHAPTER THREE

Marketing the California Walnut

By W. T. Webber, Secretary

California Walnut Growers Association

SINCE THE MOST APPROVED METHODS OF HARVESTING, GROWING, GRADING, PACKING, AND SELLING CALIFORNIA WALNUTS NOW IN VOGUE ARE THE OUTGROWTH OF THE DEVELOPMENT WORK OF THE CALIFORNIA WALNUT GROWERS ASSOCIATION, THE FOLLOWING MAY WELL BE CONSIDERED THE EXPERIENCE OF DIAMOND BRAND WALNUTS FROM THE TIME THEY ARE MATURED UNTIL THEY ARE SHIPPED FOR DISTRIBUTION TO THE CONSUMER

HARVESTING

ABOUT two-thirds of the walnuts grown drop from the trees when mature and are simply gathered up and sacked. The remainder of the crop is shaken from the trees by means of long poles with hooks attached. The hook is caught on the limb and the nuts, if mature, brought down by a vigorous shaking. About three-fourths of the nuts drop clean of the husks, the remainder usually being husked in the field by the pickers. After picking and sacking, the nuts are generally hauled into the harvesting-grounds and placed about three inches deep on trays, where they are allowed to cure thoroughly for several days.

Drying-houses have been erected by some of the growers who have a large enough acreage to support one. These houses are built with lath outer walls to give ample ventilation. The drying bins are arranged one above the other, the nuts being mechanically dumped from one bin to the bin below it. They are started in at the top, and, moving a bin at a time, are worked through the whole series. This exposes them to a ventilation surface of six or eight inches and assures uniform mixing. This process takes from four to eight days.

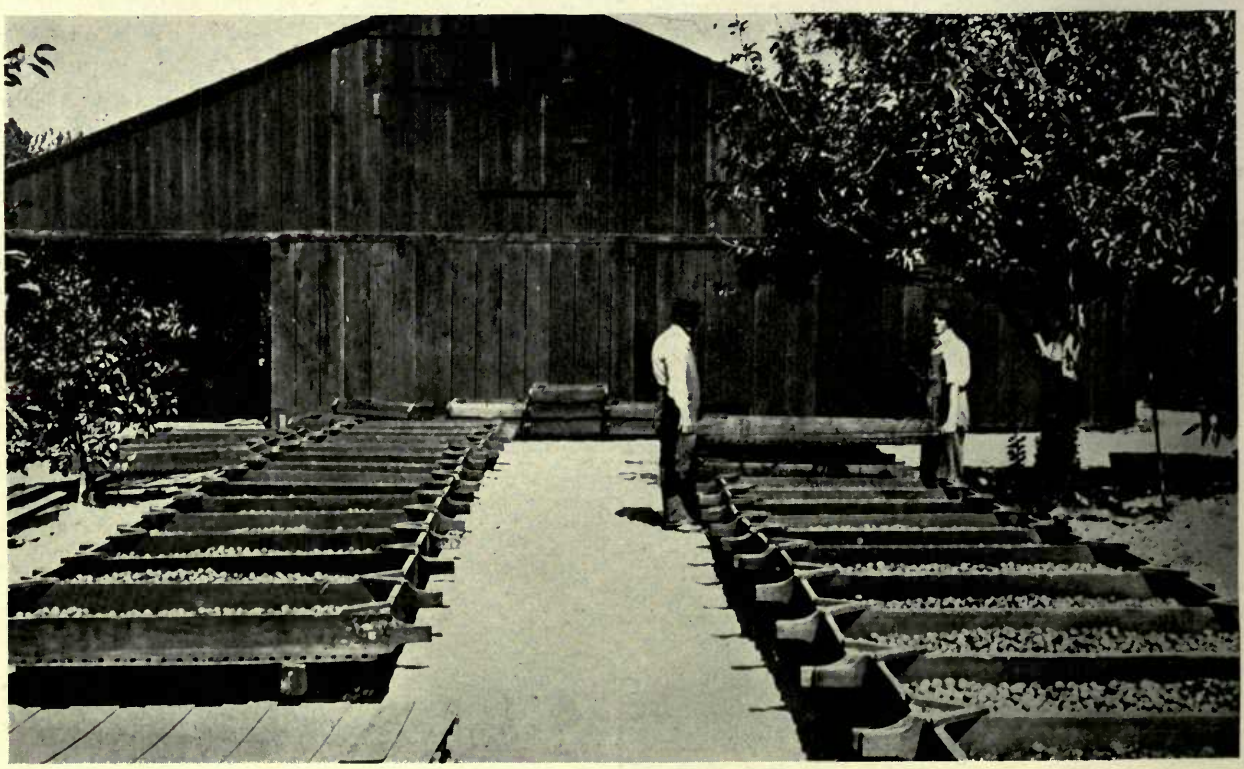
The harvesting operations usually begin about September 15th, and are principally carried on by Mexicans, who contract the picking for about $1.00 to $1.50 per one hundred pounds.

LOCAL PACKING-HOUSES

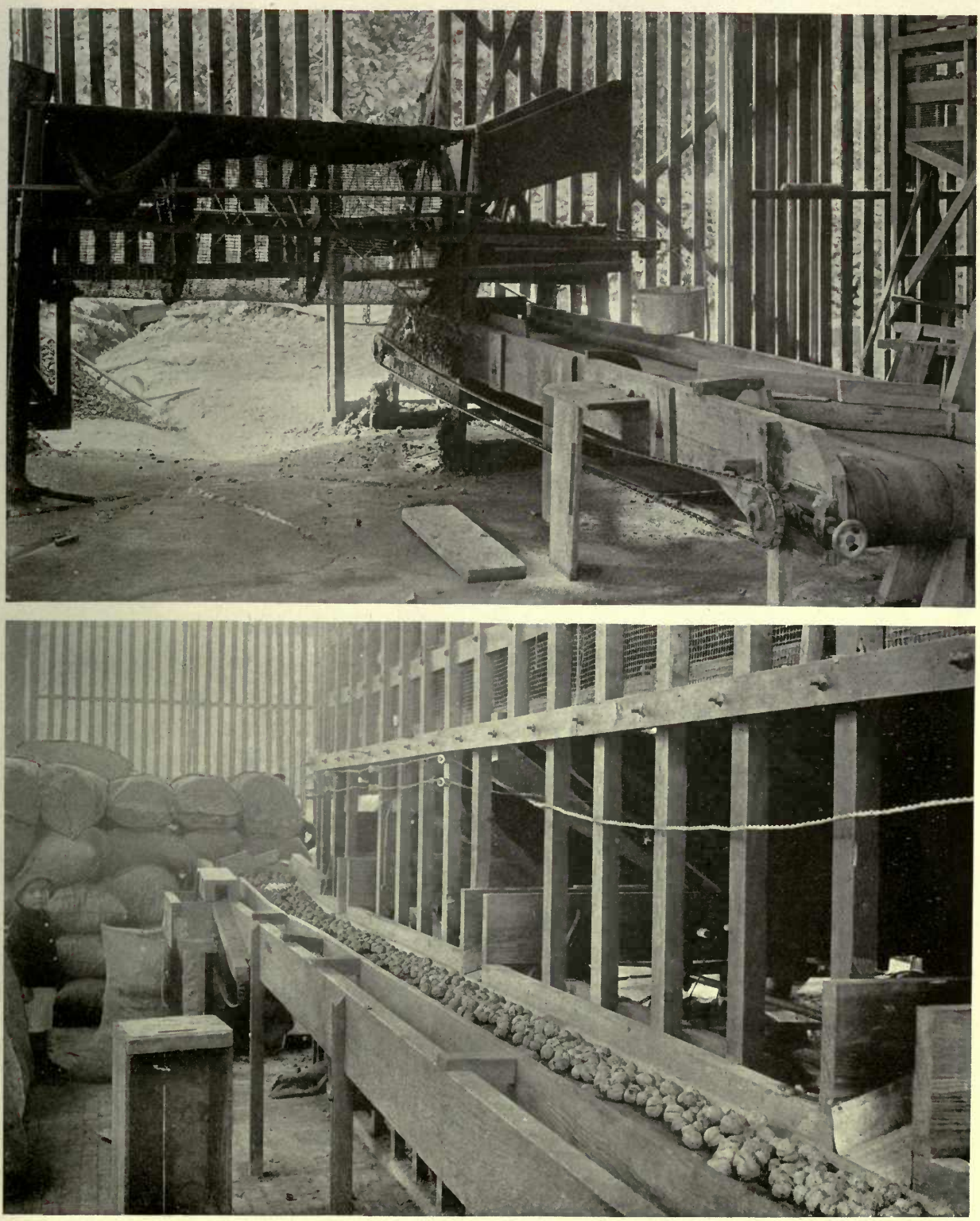
IT should be borne in mind that the California Walnut Growers Association is the parent organization for twenty-five local packing associations operating in each of the principal walnut-producing sections of the state. These local plants grade and pack the walnuts of their grower members, the output of each local association averaging about 600 or 700 tons annually. These local associations are also organized on the co-operative principle. Any grower located in the tributary section may become a member. The packing plants when originally built are usually paid for at the rate of one-quarter cent per pound per year, or less, on the output of all members; the packing-house operation is consequently carried on at actual cost to the growers.

ELIMINATING IMPERFECT NUTS

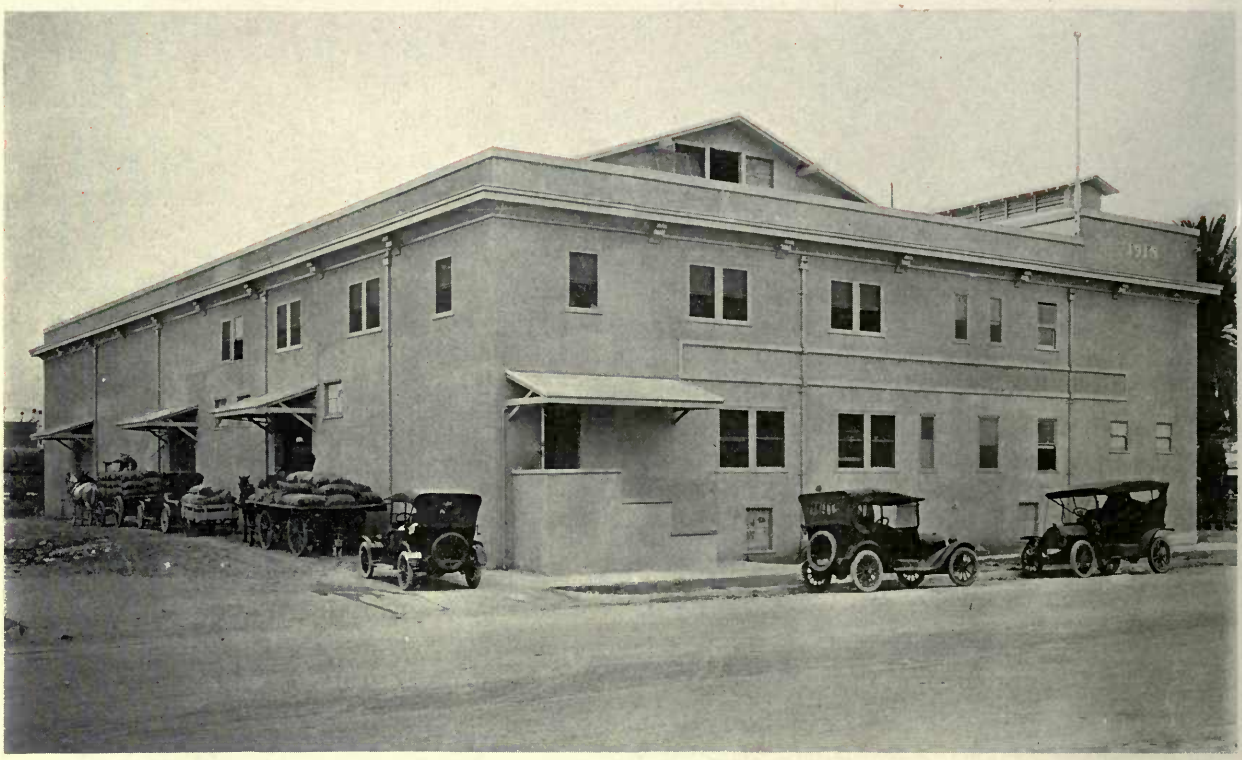
AFTER being properly cured, the nuts are delivered to the local packing-house by the grower, where they are first run over a rough screen which frees them from dirt and all foreign matter. From this screen the nuts pass through a suction machine, a device which lifts the blank or imperfectly filled nuts over a trap and allows the full-meated ones to pass through. These machines are found only in the packing-houses of the California Walnut Growers Association, which owns the patent rights thereto, and are the only means known of

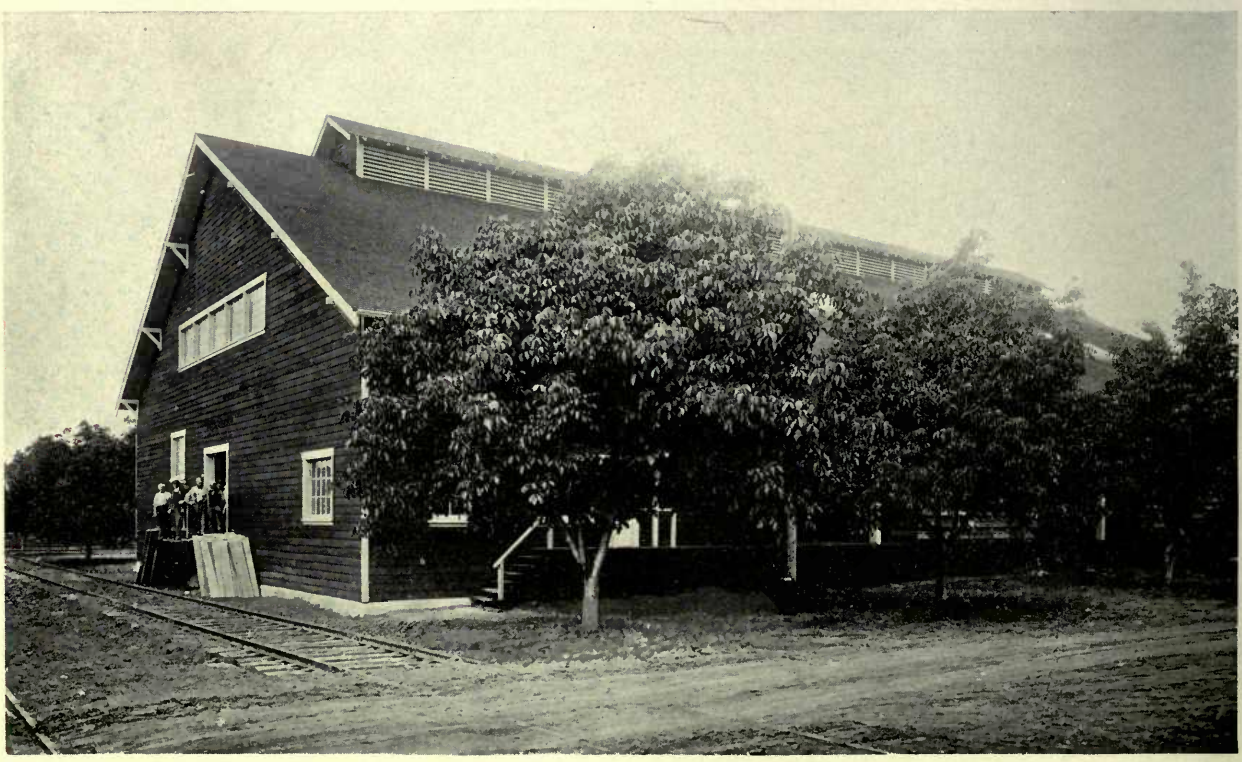


THE NUTS ARE CURED BY THE GROWER

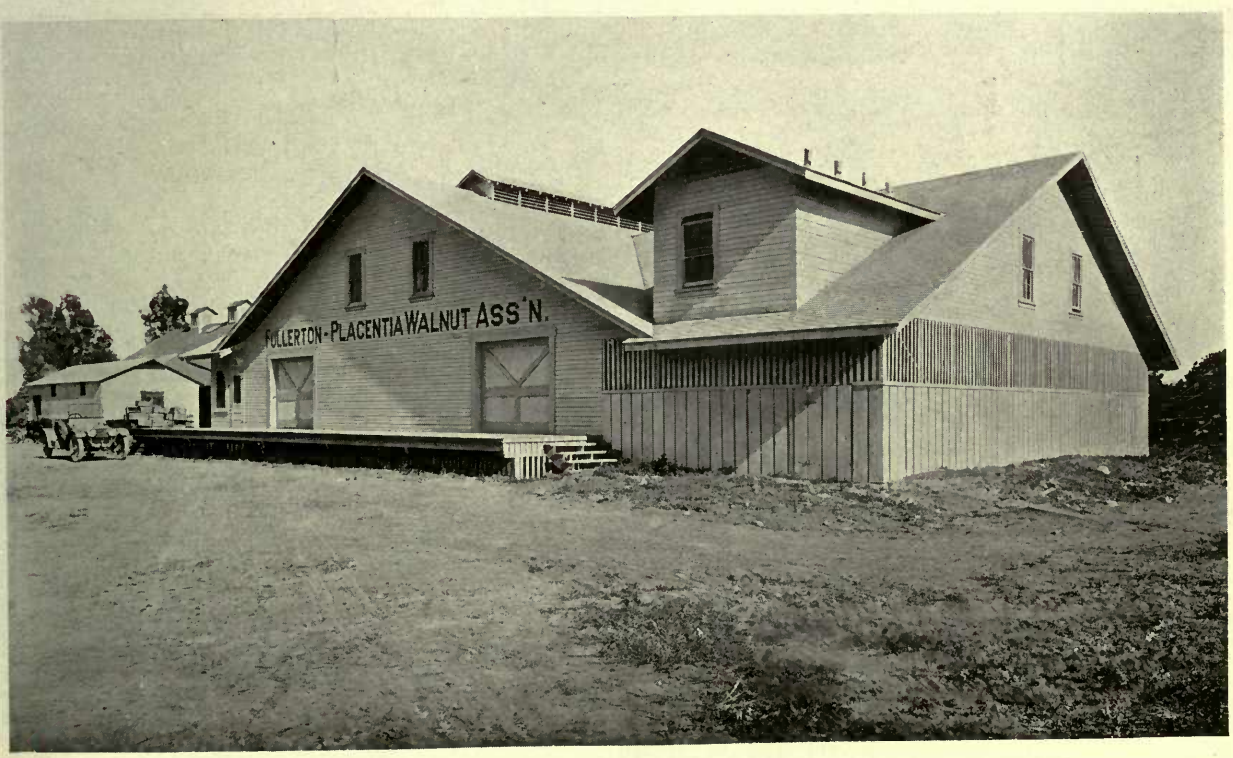


THE LARGER GROWERS MAINTAIN LATH CURING HOUSES

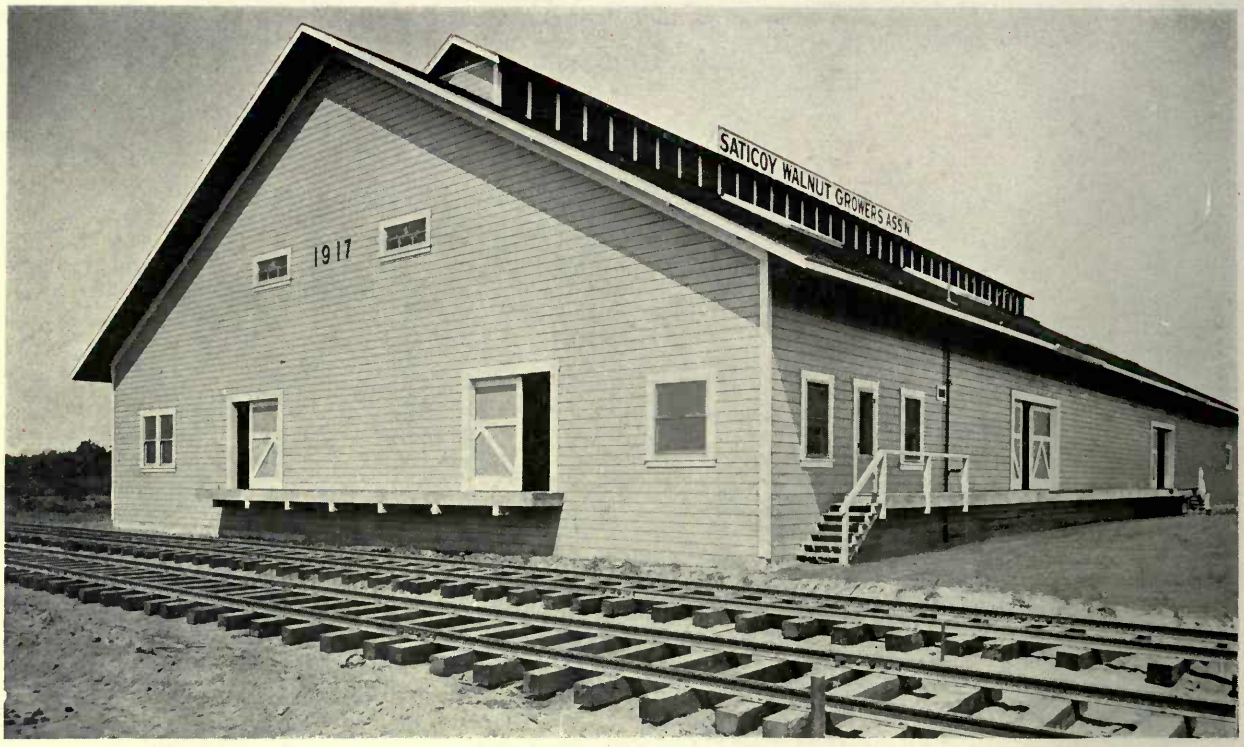




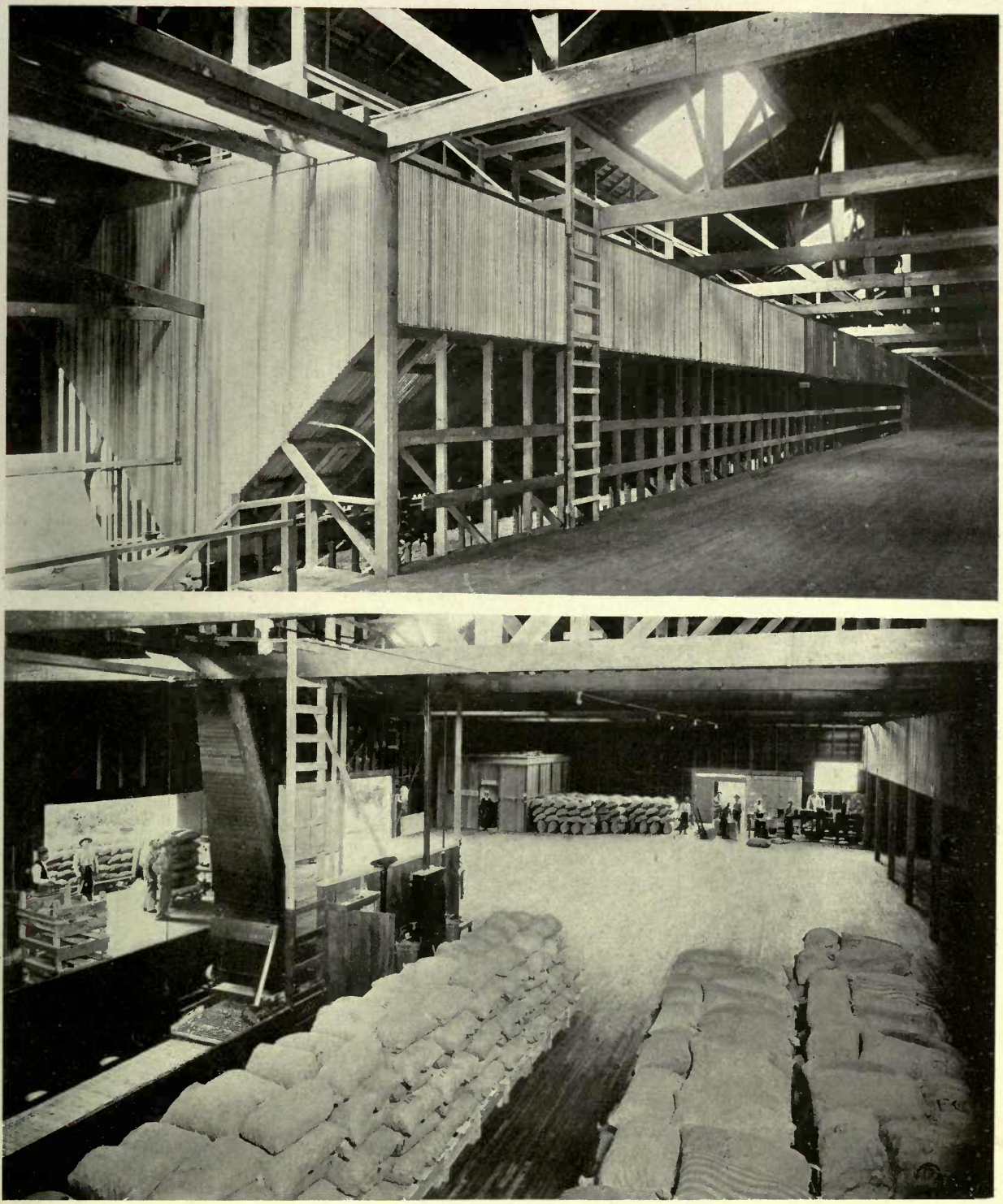
(ABOVE) THE ASSOCIATION'S PLANT AT SANTA ANA IS AS EFFICIENT AS IT IS PLEASING TO THE EYE
(BELOW) THE IRVINE PLANT IS MODERN IN EVERY RESPECT



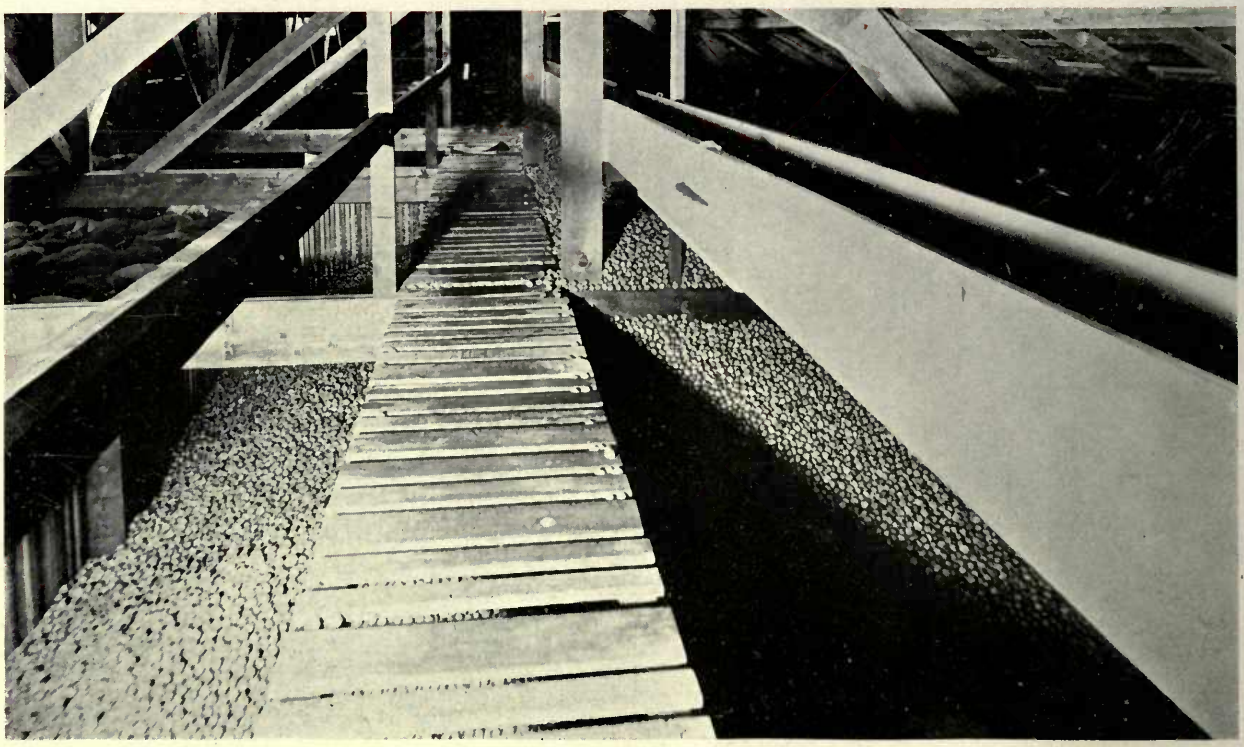
(ABOVE) THE SANTA BARBARA PLANT IS ONE OF THE MOST MODERN AND EFFICIENT
(BELOW) FULLERTON GROWERS MAKE THEIR HEADQUARTERS HERE



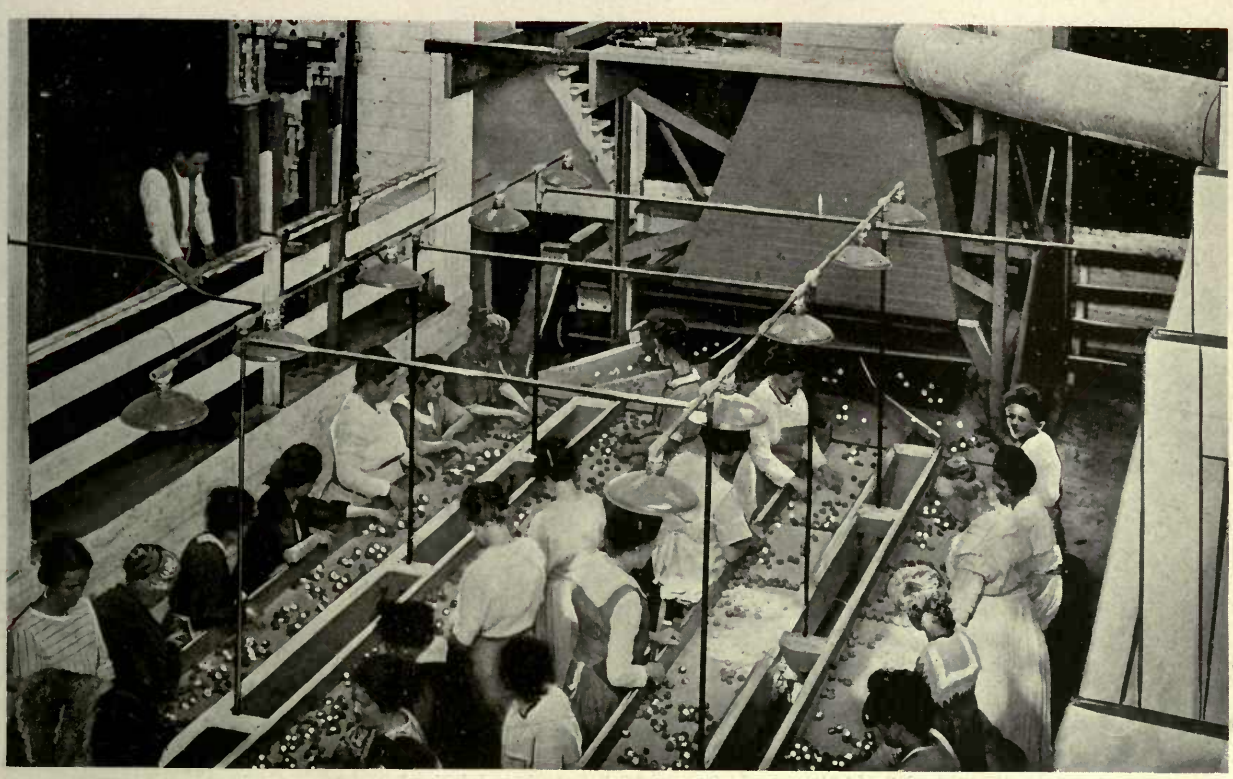
(ABOVE) THE ASSOCIATION'S SATICOY PLANT IS PLAIN BUT COMPLETE IN EVERY PARTICULAR
(BELOW) PART OF A SINGLE DAY'S DELIVERY BY GROWERS AT SATICOY



(ABOVE) WALNUT DRYING BINS AT THE SATICOY PLANT. CAPACITY, HALF A MILLION POUNDS
(BELOW) INTERIOR OF THE IRVINE PLANT



(ABOVE) AN INSIDE VIEW OF THE HUGE BINS WHERE NUTS ARE DRIED AFTER BLEACHING
(BELOW) BATTERY OF WALNUT BLEACHING DRUMS



BEFORE PASSING UNDER THE SUCTION MACHINE (IN BACKGROUND) THE WALNUTS ARE CONVEYED BY SLOW-MOVING BELTS IN FRONT OF GIRLS WHO PICK OUT THOSE OBVIOUSLY IMPERFECT

segregating full-meated walnuts from blanks. From the suction machine the full-meated nuts pass on to an endless belt where girl cullers, seated on each side, remove the ill-shapen and bad-appearing nuts.

BLEACHING

THE next treatment is that of bleaching. The nuts are given a bath of from one to two minutes' duration by passing them through large drums partially filled with a liquid bleaching solution for the purpose of removing dirt and stain and brightening the appearance of the shells. The local association packing-plants are no longer permitted to use sulphur fumes in bleaching the shell of the walnut, as it has been demonstrated that these fumes have a deleterious effect on the nut meat. Thus the Association uses only bleaching materials which are non-injurious to either the keeping quality, the flavor, or the digestibility of the nuts.

From the bleaching drums they are passed over another shaker which frees them from accumulated drops of the solution, and they are then elevated and graded to size.

GRADING

FOR this process large galvanized-iron cylindrical graders are used. Each grader is 10 feet long and 40 inches in diameter, set on a six-inch pitch, and has a capacity to properly grade one and one-half tons of walnuts per hour. A soft-shell walnut grader contains somewhat over 8000 $1^{1}/_{32}$-inch square openings, and the walnuts which pass over the grader without falling out at one of these openings are known as the Number One Grade. Those which fall out comprise the Number Two Grade.

A SECOND CULLING OF THE MACHINE-GRADED NUTS BY HAND, FURTHER GUARANTEES THEIR QUALITY

Budded graders contain somewhat less than 8000 $1\frac{3}{16}$-inch square openings, and the nuts passing over constitute the Fancy Grade and those falling through the Standard Grade.

From the grader the walnuts again pass on to a grading-belt, where those that have not been bleached properly or have been broken by the bleaching and grading operations are removed. The perfect nuts then go into the drying-bins, and after a period of from 24 to 48 hours are packed 100 pounds net weight in burlap bags ready for shipment.

INSPECTION

AT this juncture, one of the corps of inspectors employed by the California Walnut Growers Association is sent from its Los Angeles office for the purpose of inspecting the nuts and determining whether or not they reach the standards of appearance, quality, and size demanded of all walnuts packed under the DIAMOND BRAND.

The inspector opens at least one in every ten bags of the lot and removes a double handful of walnuts therefrom as a sample. He mixes all these samples in a receptacle, examining them as to appearance and size, and cracks not less than 400 nuts, keeping a careful record of the quality of each nut cracked. If the samples pass all tests, an inspection certificate is issued and the walnuts may be shipped; if not, a certificate is refused, and they must either be re-graded and brought up to the DIAMOND BRAND standards, or packed in unbranded bags and sold at a considerable reduction in price.

It should be understood that the thorough inspection and grading process described above applies only to nuts grown by the members of the California Walnut Growers Association. However, its efficiency has been so proven that we quote it as an example of what is, or at least should be, the state's walnut process.

INTERIOR OF THE ASSOCIATION'S BIG PLANT AT SANTA ANA, SHOWING PORTABLE CULLING TABLES (MAIN FLOOR) AND BATTERY OF GRADERS ON BALCONY

THE STANDARD FOR FIRST-GRADE NUTS

A BRIEF description of a first-grade walnut according to the standards maintained by the California Walnut Growers Association may not be amiss. It should be here borne in mind that the walnut is a product of "Old Lady Nature." Consequently, the general quality and cracking averages of California walnuts cannot always be maintained on a uniform basis from one year to another; but the industry has so rapidly advanced in combating the whims of the "Old Girl" through the perfection of superhuman grading devices, that an unusually large percentage of imperfect nuts can be, and is now, automatically removed from the field run as delivered to the packing plants. We may add that the Association owns and controls the patents on most of these perfected grading devices.

A nut is considered satisfactory if its size is in accordance with the specifications for the No. 1 or the No. 2 grade; if its kernel is plump and sound, not too dark in color; if it is not wormy, moldy, or rancid; and if one portion of the shell has not split and fallen away from the other. The shell must have no material outward blemish and must show a clean bright color.

MARKETING PROPER

THAT the individual producer of an agricultural product cannot market his output to the best advantage is a well-recognized fact. He lacks the control of volume necessary to economical packing and distribution and the stabilization of market through guaranteed prices. He is at the mercy of speculative buyers, who not only make a profit on their purchases, but whose costs of packing and marketing are necessarily quite heavy. This, combined with

other well-known economic factors, has brought into existence growers' co-operative selling organizations throughout the country. Since the walnut growers have proved no exception and have their own selling organization, it may be well to pause here and consider in detail the extent of that organization and the things that brought it into being.

WHAT THE CALIFORNIA WALNUT GROWERS ASSOCIATION IS

TO MR. C. C. TEAGUE, WHO WAS LARGELY RESPONSIBLE FOR THE ORGANIZATION OF THE CALIFORNIA WALNUT GROWERS ASSOCIATION AND WHO HAS BEEN ITS ONLY PRESIDENT, A LARGE MEASURE OF THE SUCCESS OF THE ORGANIZATION IS CREDITED. MR. TEAGUE HAS NEVER COLLECTED ONE CENT FOR SERVICES RENDERED THE ASSOCIATION, BUT HAS WORKED INDEFATIGABLY FOR ITS SUCCESS, AND HAS MANY TIMES, BY HIS UNFAILING LEVEL-HEADEDNESS AND GOOD JUDGMENT, GUIDED IT OVER DANGEROUS SHOALS

As early in the history of the California walnut as 1895 the Rivera Walnut Growers Association, with a membership comprised of individual walnut growers adjacent to Rivera, was organized for the purpose of grading, packing, and marketing the output of its members. This idea was adopted in other districts, and within a few years probably eight or ten local walnut growers' associations were operating in various districts in southern California.

EARLY MARKETING METHOD

THE marketing method followed by these associations was to engage the services of what is known as a coast broker, or shipper, to market their walnuts wherever a buyer could be found. As the commission paid these brokers was ordinarily 6 per cent of the selling price, there was great competition each season between them for the selling contract of each local association. Confronted with these competitive conditions, the broker dared not refuse a tender of walnuts, no matter what the quality, as by so doing he would have jeopardized his selling contract for the next season. He preferred to fight it out with the buyer and assume any necessary loss. The natural result of such a system was a gradual deterioration rather than an improvement in the quality of the so-called first grade of California walnuts, with a consequent low price level and light demand.

Again, no intelligent efforts to gain proper distribution were made, each broker fighting for the business in the larger markets and all of them more or less neglecting the smaller ones, thereby losing a large percentage of possible consumption. Almost invariably each season after the jobbers had purchased their requirements for the holiday trade, the walnut market took a decided drop, and the local association which had not been able to ship its entire output quite early was obliged to be content with considerably reduced prices for the remainder. With these price conditions prevailing year after year, and with no dependable guarantee as to quality and grading, the jobber was inclined to be chary and generally underbought rather than the reverse.

To show that the walnut business was not particularly lucrative in those days, the prices returned by the Santa Ana Valley Walnut Growers Association to its members on Number One soft-shell walnuts are here shown by seasons for a period from 1898 to 1911:

Season	Price Per Pound
1898	$.0643
1899	.0741
1900	.0950
1901	.0852
1902	.0944
1903	.1194
1904	.1044
1905	.1184
1906	.1002
1907	.1355
1908	.1074
1909	.1065
1910	.1405
1911	.1250

Growers belonging to these associations had already shown their progressiveness and fully realized that conditions were not what they should be, but there was apparently nothing they could do about it.

THE BEGINNINGS OF DIRECT MARKETING

ABOUT this time two young men in Ventura County conceived an idea. C. Thorpe, manager of the Santa Paula Walnut Association, and H. C. Sharp, manager of the Saticoy Walnut Growers Association, decided in 1909 to make no selling contracts, with the coast broker, but to market the output of their houses themselves, selling direct to the wholesale grocer and fruit jobber. They put out a high-grade pack under their association brands and gave their trade the very best possible service and treatment. The success of this method became immediately apparent, and these two managers were for several years able to make returns to their growers materially higher than those received by growers of associations who still sold through the coast brokers.

FORMATION OF ASSOCIATION INCREASES PRICES

NATURALLY their success attracted attention. Indeed, such an impression did it make that in 1912 some fifteen local associations organized the California Walnut Growers Association, the function of which was to market their walnuts along exactly the same lines which had proven so advantageous to the Santa Paula and Saticoy growers.

It is interesting to note the steady year-to-year increase in the price of walnuts since the Association was organized. The Association opening prices for DIAMOND BRAND No. 1 Walnuts, which have never been lowered, but several times increased, are shown by seasons.

This table, compared with the one showing earlier prices received by the Santa Ana growers, forms an instructive comparison:

Season	Price
1912	14.0 cents
1913	16.0 "
1914	16.5 "
1915	13.6 "
1916	15.5 "
1917	20.1 "
1918	28.0 "

WHAT THE CALIFORNIA WALNUT GROWERS ASSOCIATION HAS DONE

MR. CARLYLE THORPE, GENERAL MANAGER OF THE ASSOCIATION SINCE 1913, HAS, THROUGH INHERENT ABILITY, "NEVER SAY DIE" SPIRIT, CLOSE STUDY OF HIS WORK, AND DUE APPRECIATION OF THE NEEDS OF GROWER AS WELL AS BUYER, BROUGHT THE CALIFORNIA WALNUT GROWERS ASSOCIATION TO A POSITION IN THE EYES OF THE BUSINESS WORLD REACHED BY FEW AND EXCEEDED BY NONE

WHILE at its inception the California Walnut Growers Association marketed only 54 per cent of the output of the state, its avowed principles were:

A standardized pack of high and guaranteed quality under its DIAMOND BRAND, *which meant the elimination of the various brands used by its local members.*

To stabilize market conditions by guaranteeing prices against decline, thus justifying distributors in buying more freely and carrying heavier stocks, thereby widening the consumption period.

To judiciously distribute its product, and through continued sales efforts to widen the distribution and increase the consumption of California walnuts, appreciating full well that maximum demand is only possible through the widest distribution.

To at all times take every possible action tending toward the improvement of the quality of its pack and the conditions affecting the growing and marketing of California walnuts.

To say that the California Walnut Growers Association, with its fifteen local association members representing only 54 per cent

of the growers, was an eminent success its first year would be a marked digression from the truth, because it had its troubles and made many errors through lack of experience. But the organization was unquestionably an improvement over the old methods, as evidenced by the fact that it showed rapid and continual growth.

As the increasing benefits it gained for the members became apparent other local associations joined, and other districts formed associations for the purpose of joining, until during the 1918 season the California Walnut Growers Association marketed nearly 80 per cent of the walnuts grown in the state at the highest prices ever known, and which brought its members a return of almost nine million dollars.

DIAMOND BRAND

ONE of the first acts of the directors after the organization of the Association was to choose and copyright its DIAMOND BRAND trade-mark, under which all first-grade walnuts since marketed by it have been packed. In adopting this identifying mark for their product, the Association was not blind to the fact that it was assuming a very definite responsibility for the uniform quality of the walnuts which it might thereafter place upon the market. The directors realized that an advertised trade-mark could have no permanent value unless backed up by goods of merit. Accordingly uniform standards of size, quality, and appearance were adopted. Walnut harvesting, handling and grading systems have since been repeatedly improved upon as a result of the work of the Association's experts, until today DIAMOND BRAND Walnuts unquestionably have first call with a great percentage of the trade in all markets of the United States. Indeed, during the latter part of the 1918 season, when all shippers had walnuts to sell, many instances occurred where buyers purchased DIAMOND BRAND at a premium of from one-half to two cents per pound over goods offered under other brands.

GUARANTEED PRICES

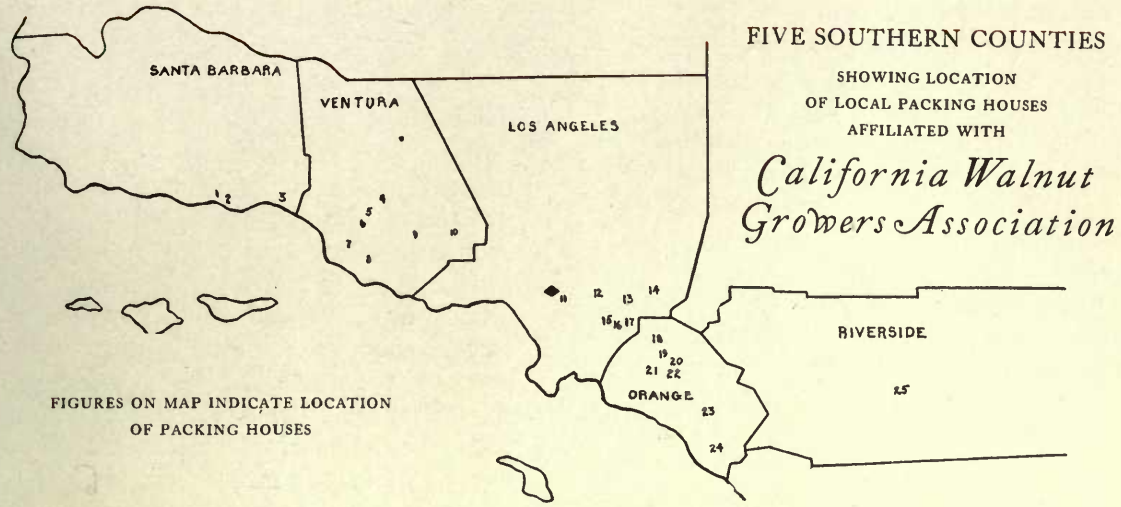
ANOTHER important fact of which the Association's directors had full realization was that the wholesale grocer and fruit jobber unquestionably afforded the most economical means of distributing their product to the retailer, and through him to the consumer. And further, that to get the fullest co-operation of these distributors it was necessary to reasonably assure them that their walnut operations would return a profit.

To do this it was necessary to eliminate the old condition of a serious drop in walnut prices occurring immediately after the holidays. Consequently, a form of contract approved by the National Wholesale Grocers Association, to be used by the Association covering its orders from the jobbing trade, was adopted. This contract, in addition to providing for definite standards of quality and size as well as other details commonly found in a contract form, stipulated that the Association should, at the beginning of its shipping season, name a season's price on each of its grades of walnuts, such price to be fully guaranteed against its own decline for the succeeding eleven months. In other words, on any reduction in the opening prices the buyer was rebated accordingly on all stocks on hand.

While this guarantee did not mean much in 1912, coming as it did from an Association with its fifty-four-per-cent output control and puny four-thousand-ton shipments, it was a step in the right direction, and as the Association's membership percentage increased the great value of the price guarantee was fully proven. In fact, it is now one of the bulwarks of the industry.

QUALITY GUARANTEED

IN the old days the best the jobber got in the way of a quality guarantee was a clause in his contract reading something like this: "Equal in quality to the season's average produced in the district from which walnuts are shipped."



FIVE SOUTHERN COUNTIES

SHOWING LOCATION
OF LOCAL PACKING HOUSES
AFFILIATED WITH

California Walnut Growers Association

FIGURES ON MAP INDICATE LOCATION
OF PACKING HOUSES

1. Bishop-Stow Ass'n. .....Coromar, California
2. Santa Barbara County Walnut Growers Ass'n..Goleta, California
3. Carpinteria Walnut Growers Ass'n. .....Carpinteria, California
4. Sespe Land & Water Company .....Sespe, California
5. Santa Paula Walnut Ass'n. .....Santa Paula, California
6. Limoneira Company .....Limco, California
7. Saticoy Walnut Growers Ass'n. .....Saticoy, California
8. Oxnard Walnut Growers Ass'n. .....Oxnard, California
9. Moorpark Walnut Growers Ass'n. .....Moorpark, California
10. Simi Valley Walnut Growers Ass'n. ....Santa Susana, California
11. Cudahy Walnut Orchard .....Los Angeles, California
12. El Monte Walnut Growers Ass'n. .....El Monte, California
13. La Puente Valley Walnut Growers Ass'n. ....Puente, California
14. Walnut Fruit Growers Ass'n. .....Walnut, California
15. Whittier Walnut Growers Ass'n. .....Whittier, California
16. Leffingwell Walnut Orchard .....Leffingwell, California
17. La Habra Walnut Growers Ass'n. .....Des Moines, California
18. Fullerton-Placentia Walnut Ass'n. .....Fullerton, California
19. Anaheim Walnut Growers Ass'n. .....Anaheim, California
20. Richland Walnut Ass'n. .....Orange, California
21. Garden Grove Walnut Growers Ass'n. ..Garden Grove, California
22. Santa Ana Walnut Growers Ass'n. .....Santa Ana, California
23. Irvine Walnut Ass'n. .....Irvine, California
24. Capistrano Walnut Growers Ass'n. San Juan Capistrano, California
25. Hemet Walnut Growers Ass'n. .....Hemet, California

Inasmuch as walnuts are grown in at least twenty-five southern California districts, in an area over two hundred miles long and thirty miles wide, and the average season's quality as to districts may be widely different, due to varying weather and other conditions, such a quality guarantee was not of much value.

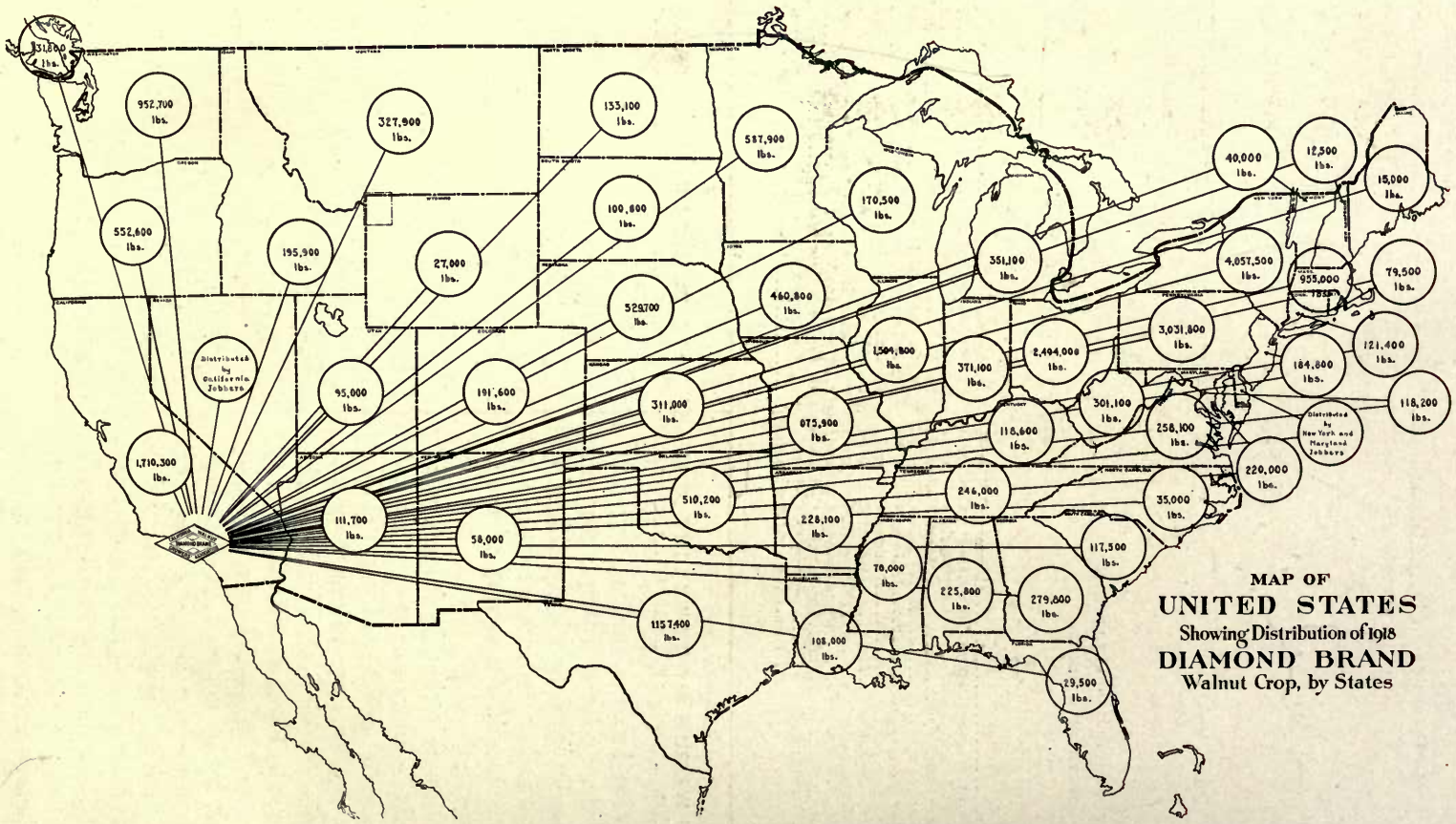
The Association felt that its buyers were entitled to a definite guarantee of quality, and consequently inserted in its contract a clause providing that at the time prices were announced season's cracking standards would also be announced. These standards set the minimum percentage of sound merchantable nuts which each lot of walnuts should average. In past seasons the cracking standard for DIAMOND BRAND Walnuts has varied from 87 to 90 per cent, but it has always been the policy of the Association to ship goods cracking well over the guaranteed minimum. For instance, the 1918 season cracking standard for DIAMOND BRAND No. 1's was 88 per cent, yet the total shipments made by the Association averaged well over 94 per cent.

DISTRIBUTION

AS stated, before the advent of the Association the point of a thorough distribution of California walnuts in all markets of the United States had been sadly neglected. The sales department immediately set out to correct this condition, and its efforts have been attended with such success that today DIAMOND BRAND Walnuts are well known to every wholesaler of food products in this country, and he is, through personal calls by the Association's representatives, afforded many opportunities each season to buy them.

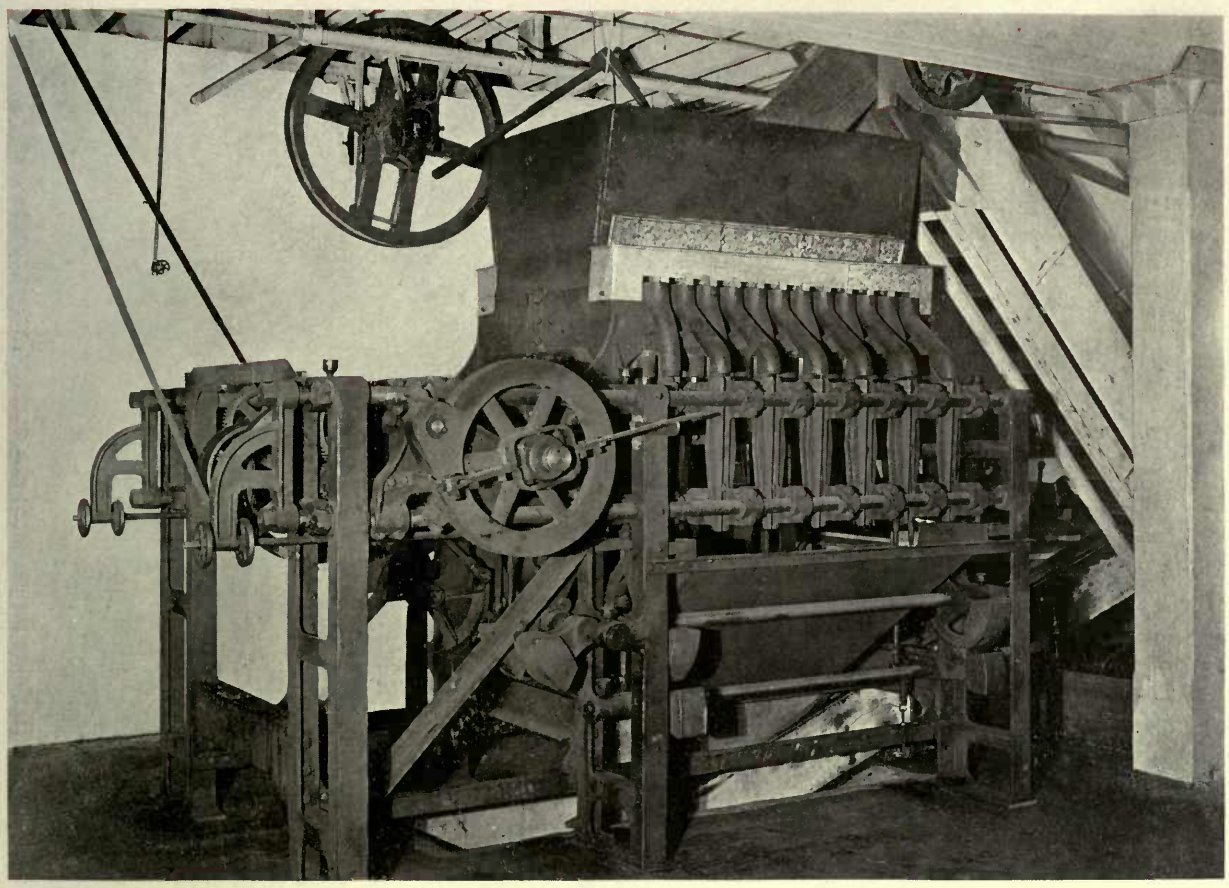
CULL WALNUTS AND WALNUT MEATS

IT must be understood that many of the walnuts produced are, through poor appearance, being blighted, partially filled, and for other reasons, unsuitable for market-



MAP OF
UNITED STATES
Showing Distribution of 1918
DIAMOND BRAND
Walnut Crop, by States

WHERE DIAMOND BRAND CALIFORNIA WALNUTS GO



PATENTED WALNUT CRACKING MACHINE. CAPACITY 15 TONS PER DAY

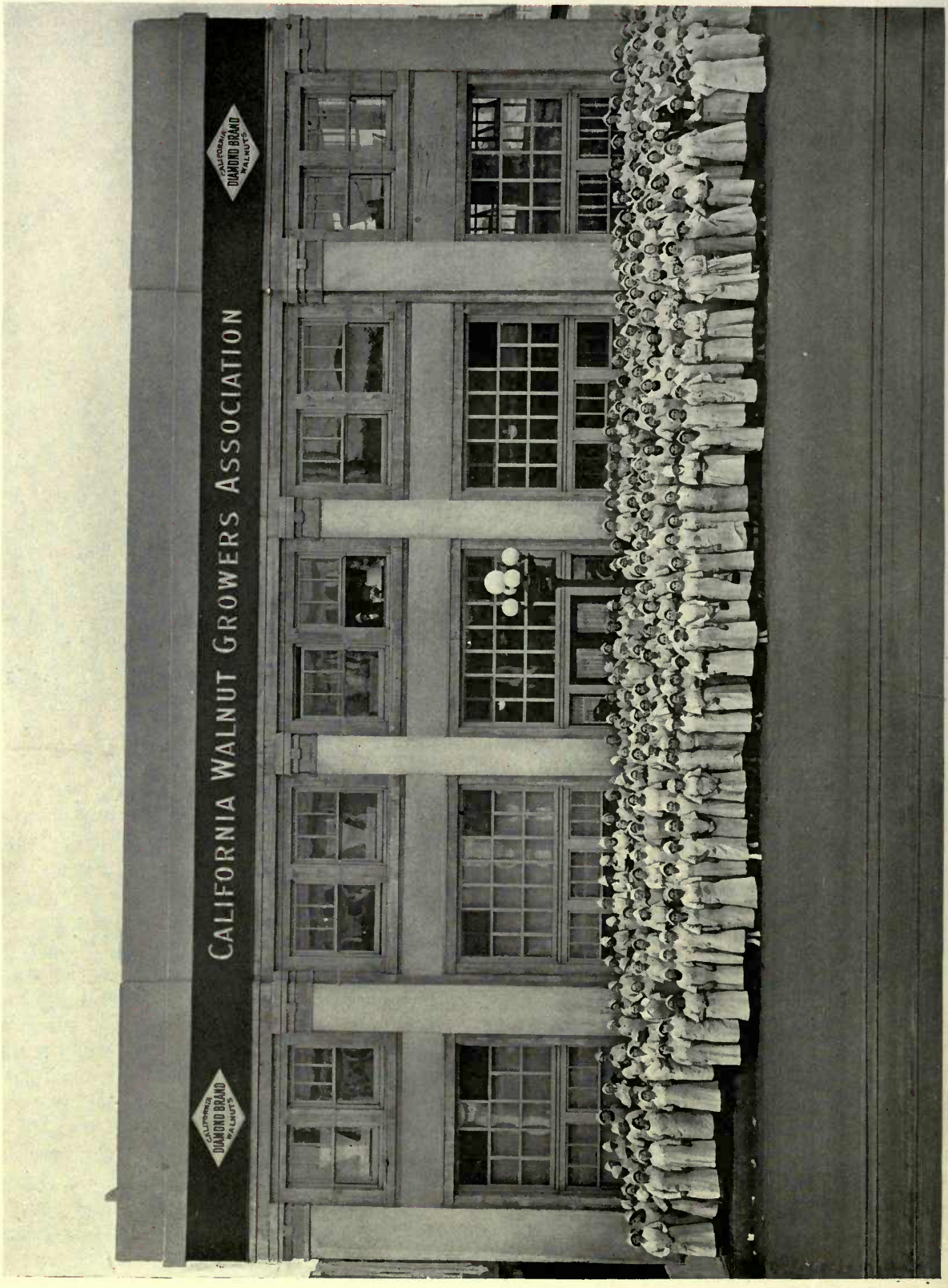
ing in their natural state. The percentage of such nuts varies considerably from season to season, depending upon conditions prevalent during the growing season, but the average, of course, materially increasing as the quality standards of the Association were raised.

In the old days such walnuts, which are known as culls, were sold by the grocer or packing-house manager to cull peddlers who took them at the grove or packing-house, the price paid ranging from 1½ to 3 cents per pound. The peddlers' usual method of disposing of these culls was to put them on the inside of a bag, top with good nuts, and foist them off on the dealer and public as first-class goods.

As time went on it became more and more noticeable that these tactics were seriously retarding the sale of good walnuts, especially on the Pacific Coast, for the simple reason that the dealer or housewife after being swindled a few times decided that good walnuts could not be had and refused to buy further.

With no thought of getting a higher return for their cull walnuts (in fact, really expecting a loss), but for the general good of the industry, the management and directors of the Association in 1915 built its first cracking plant. There Association growers' culls were sent for the purpose of cracking them and extracting the edible meats.

After being extracted the meats were assorted into four classes—namely, Light Halves, Light Pieces, Light Amber Halves and Pieces mixed, and Dark Halves and Pieces mixed. These goods were offered to



GENERAL OFFICES AND BY-PRODUCT PLANT OF THE CALIFORNIA WALNUT GROWERS ASSOCIATION, WITH SOME OF THE FOUR HUNDRED WOMEN EMPLOYED

the trade under the DIAMOND BRAND, and the 1915 season output finally sold at prices which netted the grower a slightly larger return for his culls than he had heretofore received. But, at that time, the big noticeable point was the marked increase in the sale of DIAMOND BRAND Walnuts on the Pacific Coast generally, and in Los Angeles particularly.

However, the management, through more efficient factory operations and more intelligent sales efforts, had gained a confidence in its ability to ultimately make the walnut-meats business an important one and cull returns much greater than any grower had ever hoped for.

Mechanical cracking, sorting, and cleaning machines were patented and improved upon; larger, commodious, and more economically arranged quarters for operations as well as employees were secured; and an educational sales campaign for the purpose of widening distribution and increasing consumption was launched. The results obtained speak for themselves. Since the installation of the first cracking plant, net cull returns to growers have increased each year, until for the 1918 season they ran as high as 18¾ cents per pound, with an average of almost 15 cents per pound.

From one little poorly arranged and equipped plant, employing a maximum of 150 operatives and handling less than five tons of culls per day, to three fine up-to-date well-lighted and equipped plants employing over 600 operatives and handling over twenty-five tons of culls per day, represents the Association's factory progress since putting DIAMOND BRAND Walnut Meats on the market.

The largest of these plants, located at Los Angeles, employs an average of 400 girls for the season's duration of from five to seven months each year. The other plants, employing 100 girls each, are located on the top floors of the magnificent new walnut-packing houses at Santa Ana and Goleta, California, respectively.

When the Association's sales department first assumed the burden of marketing its output of meats, practically the only outlet was the candy manufacturer and soda-fountain supply houses, and only such of these houses as were located in the Western and Pacific Coast states. Eastern houses viewed original attempts to interest them in California walnut meats coldly,—first, because they had never heard of California meats, having always been accustomed to using imported stock; second, because the large percentage of California meats ran to the amber color, and the user could not believe that they were of as good quality or could be used in his product to the same advantage as the much lighter-colored, though higher-priced, imports.

The sales department, pinning its faith to the facts that the color of California meats was literally only skin deep, and that their fine flavor and excellent keeping qualities, as well as the dependability and uniformity of pack, were much superior to those of imports, set out to so convince the trade. Also a drive was made to introduce DIAMOND BRAND Walnut Meats to the consumer through the distributing mediums of the wholesale and retail grocers. The signal success of this work is shown in the constantly increased prices received. (See table below.)

So not only has the Association accomplished its original purpose of taking cull walnuts off the market, but it has by a simple manufacturing expedient changed a commodity unfit for human consumption to a highly

Season	Light Halves	Light Pieces	Light Amber	Dark Amber	Dark
1915	32c. per lb.	28c. per lb.	18c. per lb.		8c. per lb.
1916	36c. "	32c. "	24c. "		12c. "
1917	65c. "	52½c. "	50c. "		26c. "
1918	80c. "	70c. "	65c. "	50c. per lb.	32½c. "

(ABOVE) OFF-GRADE WALNUTS, MACHINE CRACKED IN THE ASSOCIATION'S LOS ANGELES BY-PRODUCT PLANT
(BELOW) WOMEN ASSORTING THE WALNUT MEATS INTO FIVE GRADES

nutritive and attractive food product that may be sold at attractive prices.

"DIAMOND BRAND NEWS"

THAT a partner in a business enterprise, whether active in its management or not, is entitled to fullest information concerning its activities is a principle based on common sense as well as on common law. The walnut grower, being a partner in the California Walnut Growers Association, is not content to just harvest his walnuts, turn them over to the local packing-house, and cash checks for his returns. He wants to know what is going on —how sales are, how the market is, what the prospects for next season are, and the whys and wherefores of things generally—and if he knows these things, he takes a greater interest in the welfare and upbuilding of the Association.

The directors of the California Walnut Growers Association were quick to appreciate the desirability of keeping member-growers intimately in touch with the Association's problems and affairs. However, the original method of conveying this information, through spasmodically issued circular letters, soon proved too cumbersome, and in 1916 the Association management published the first issue of its house-organ, the "DIAMOND BRAND NEWS." Since that time the paper has been published regularly every two months during the off season, and every month during the harvesting season.

It not only keeps the growers informed regarding the condition of their business, but it also carries frequent constructive articles written by experts pertaining to the many cultural problems in the interests of quicker and better harvesting, new, larger, and better-equipped packing-houses, additional membership, and that one idea that is always kept before them, "Better walnuts under the DIAMOND BRAND."

The "DIAMOND BRAND NEWS" is mailed to all growers of record whether they belong to the Association or not, and is unquestionably read from "kiver to kiver" by most of them. It undoubtedly is serving its purpose, which is to foster the interest of the California walnut industry in general and the co-operative spirit in particular.

FOREIGN INFORMATION

IT is probably not generally known that, in normal times, over fifty per cent of the walnuts consumed in the United States are imported. The best of these imported nuts, which come from France and Italy, usually sell from two to five cents per pound below the best grade of Californias. Naturally, with this large tonnage in competition, it is of vital importance that the Association, when naming its season's opening prices, have detailed and accurate information concerning the size, quality, and seasonableness of the French and Italian walnut crops as well as the prices prevailing.

To make doubly sure of having this necessary information at all times at its command, the Association maintains an office in Grenoble, France, in charge of a salaried agent. The entire time of this agent is devoted to gathering information and statistics concerning the walnut crops and conditions in France, Italy, and Spain for submission to the Los Angeles office of the Association.

He makes frequent investigational trips to the walnut-growing sections of all three countries, as well as keeping in close touch with transportation, trade, and market conditions, cabling or writing his findings as their importance and expediency may demand.

MEMBERSHIP DEPARTMENT

FOR many years no particular effort was made to induce outside growers to join the local associations. They were welcome if they wanted to come in, but were seldom requested to do so. The Association membership and tonnage were continually increasing, and the time and thought of the management were almost wholly directed to other problems.

However, as DIAMOND BRAND Walnuts grew in popularity and consumption in-

creased, the demand far outpaced the supply. Since the Association is building for the future day when new acreage and improved cultural methods will double the present California walnut tonnage, the problem of supplying this demand and keeping it alive is of great importance.

To have more walnuts to sell under the DIAMOND BRAND the Association must have more acreage; consequently, its Membership Department was recently organized for the primary purpose of conducting a continual and intelligent campaign for new growers.

This department is compiling records and maps showing every bit of acreage in southern California set to walnuts, with the age and variety of the trees, indicating whether its owner belongs to a local association, and if not, why not. It carries on regular drives for new members in conjunction with local managers or secretaries in the different districts, and has found that in a great many cases the grower was perfectly willing, and even anxious, to join the Association, but had not done so because he had not been invited.

However, it should be understood that the activities of the Membership Department are not directed solely toward getting new members. In fact, one of its principal duties is to look after the welfare of Association growers. The grower may be disgruntled because he feels his walnuts have been culled too heavily, because a load was refused at the packing-house as not properly cured, his payments from the local too long delayed, some packing-house employee has been rude to him, some independent shipper has offered him more for his walnuts than the Association paid, or by some of the many other unpleasant occurrences which can arise. These things the Membership Department learns of and endeavors to run down and smooth out.

ADVERTISING

THE value of advertising as an adjunct of other sales efforts in widening the distribution and increasing the consumption of an article or product of merit is so generally appreciated that no comment is necessary.

With the rapidly increasing production of walnuts in California which has already been mentioned, the Association is naturally looking toward, and building for, the time when the demand as it is at present will be insufficient to absorb the output.

As the walnut production is increasing comparatively at a much more rapid rate than the population of the United States, the natural consumption increase will be insufficient, and consequently the Association has launched a national advertising campaign, to be carried on in a large way each season regardless of the relative standing of supply and demand. The advertising has been and will continue to be along the lines of bringing forcibly to the housewife and consumer the high nutritive value and palatableness of California walnuts, as well as the many tasty dishes and goodies of which California walnuts are the principal ingredient. This for the purpose of increasing consumption, as well as for laying stress upon the fact that California walnuts are good to eat the year round, not just a Thanksgiving and Christmas delicacy.

In answer to the numerous requests as to the ways California walnuts should be used, the California Walnut Growers Association has just published for free distribution an attractive recipe booklet showing the varied uses of its product in making many good dishes better, and how to prepare new and exquisite goodies.

The excellent value of such advertising has already been proven by the Association's 1918 season campaign, the direct result of which was that during the period from January first to July first, 1919, more than ten times the quantity of California walnuts were consumed than during the same period of any previous year.

SELLING COST

AS previously mentioned, the selling costs of the local associations before the organization of the California Walnut Growers Association were 1½ per

cent trade discount and 6 per cent commission to the coast brokers, both percentages being figured on the f.o.b. value of the goods.

The Association during each of the seven years of its existence has been able to materially reduce these costs. For the first five years its total yearly expense amounted to 1½ per cent trade discount and 3½ per cent selling cost. In 1917, due to an unusually short harvesting period and quick movement of the entire crop, the selling expense was reduced to 2½ per cent. The 1918 season crop, which was by far the largest ever produced, and in the selling of which the Association was confronted with very delicate and serious market conditions, was sold at a cost of 3 per cent. In addition to this the trade discount was reduced from 1½ to 1 per cent, making a total saving to Association growers on the actual marketing cost of the 1918 crop over the old method of more than $300,000.00.

This showing is all the more gratifying to the management of the Association since the 3 per cent, while called "selling expense," really covers every expense. In other words, the Association's members were returned the full opening price value of their walnuts less 1 per cent discount and 3 per cent expense, the latter including not only actual selling cost, but the expense of maintenance of field department, membership department, legislative work, and advertising.

COMMON BENEFITS

WHILE the advantages accruing to the grower and distributor have been particularly emphasized, it should not be assumed that the Association, in building up its business on DIAMOND BRAND Walnuts, has given no thought or consideration to the consumer other than asking him to "pay the freight."

Through the Association's efforts, the consumer is given a product of much higher average quality, and is protected in a large degree from being swindled by unscrupulous dealers who would, if they could procure them, sell walnuts almost worthless in food value at first-grade prices. The average American today is particular, and walnuts are no longer "just walnuts." He knows that California produces the best walnuts grown, that the best of these are packed under the DIAMOND BRAND, and he buys accordingly.

But the principal advantage accruing to the consumer through the development of the Association is the reduction of that generally wide margin between the amounts the producer receives and the consumer pays for a product. Dean Hunt of the University of California has said that for the average food product the consumer pays at least three times what the producer receives. In other words, goods for which the producer gets one dollar cost the consumer three dollars.

By the elimination of many unnecessary speculative elements in its efforts to put DIAMOND BRAND Walnuts in the hands of the consumer by the cheapest and shortest possible route, the California Walnut Growers Association has just reversed this average condition. WALNUTS FOR WHICH THE PRODUCER GETS ONE DOLLAR TODAY COST THE CONSUMER AN AVERAGE OF BUT ONE DOLLAR AND THIRTY-FIVE CENTS.

CONCLUSION

IF the foregoing pages have fulfilled their mission, the reader is aware of the mammoth proportions to which the walnut industry has attained in California. If he has taken time to read the cultural notes, he realizes that the California walnut grower deserves to be classed as a scientific producer of a high-grade food product.

When he stops to consider that a pound of walnuts contains more heat calories than a like amount of beefsteak, the reader will find it easy to account for the growing popularity of the walnut as an article of daily diet. The attained knowledge of its nutritious and economic value as a substitute for meats, having converted the walnut from a holiday luxury to an every-day food, is sufficient to perpetuate the stability and prosperity of the industry.

With the organization of the industry

based on sound principles of co-operation, the growers have been able to market an annually increasing crop at prices which guarantee a ready consumption and at the same time a satisfactory return to the producer on his investment. With the active and far-sighted steps being taken by the California Walnut Growers Association to increase the consuming demand to take care of the rapidly increasing production, the future of the walnut industry in California appears very promising.

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